ISSN-0976-0245 (Print) • ISSN-0976-5506 (Electronic)

Volume 9 | Number 2 | February 2018

Indian Journal of Public Health Research & Development

An International Journal

SCOPUS IJPHRD CITATION SCORE

Indian Journal of Public Health Research and Development Scopus coverage years: from 2010 to 2017 Publisher: R.K. Sharma, Institute of Medico-Legal Publications ISSN:0976-0245E-ISSN: 0976-5506 Subject area: Medicine: Public Health, Environmental and Occupational Health

CiteScore 2015- 0.02

SJR 2015- 0.105

SNIP 2015- 0.034

Covered by Scopus

EMBASE

Approved by MCI

Website:

www.ijphrd.com

Indian Journal of Public Health Research & Development

Print-ISSN: 0976-0245-Electronic-ISSN: 0976-5506, Frequency: Quarterly (Four issues per volume)

Indian Journal of Public Health Research & Development is a double blind peer reviewed international journal. It deals with all aspects of Public Health including Community Medicine, Public Health, Epidemiology, Occupational Health, Environmental Hazards, Clinical Research, and Public Health Laws and covers all medical specialties concerned with research and development for the masses. The journal strongly encourages reports of research carried out within Indian continent and South East Asia.

The journal has been assigned International Standards Serial Number (ISSN) and is indexed with Index Copernicus (Poland). It is also brought to notice that the journal is being covered by many international databases. The journal is covered by EBSCO (USA), Embase, EMCare & Scopus database. The journal is now part of DST, CSIR, and UGC consortia.

Website : www.ijphrd.com

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501, Manisha Building, 75-76, Nehru Place,
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Printed, published and owned by

Dr. R.K. Sharma
Institute of Medico-legal Publications
501, Manisha Building, 75-76, Nehru Place,
New Delhi-110019

Published at

Institute of Medico-legal Publications
501, Manisha Building, 75-76, Nehru Place,
New Delhi-110019

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www.ijphrd.com

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Volume 9, Number 2 February 2018

DOI Number: 10.5958/0976-5506.2018.00140.7

Anonymous Location-Support and Self-Reliance Routing Protocol For Manet

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ABSTRACT

Mobile Adhoc Network (MANET) is comprised of mobile nodes where each mobile node can act as of any type like starter, router and terminal. While performing node operations, a reliable routing protocol is chosen that ensures packet to reach its destination securely. Therefore Anonymous Location-Support and Self-reliance Routing (ALsSrR), a protocol for secure packet transmission in MANET are proposed. To keep the packets secure from adversary environment and to provide message encryption for secure data forwarding are the primary objectives of the protocol. This protocol includes anonymity protection for delivering node uniqueness which includes Modular arithmetic and Euclidean algorithm for providing node security. The MD5 algorithm is used for message encrypting and decrypting process. The performance evaluation is shown, and the efficiency is compared with both the conventional and proposed protocols.

Keywords: *Security, Anonymity, GPSR, MD5, Hierarchical Routing, MANET.*

INTRODUCTION

MANET's have created an essential place in the wireless communication field, particularly with the obligation for portability all through data communication. Some typical characteristics of MANET's include Multi-hop routing, Distributed operation, Independent and lightweight terminals as well as some extraordinarydistinctiveness such as Dynamic topology and Shared Physical Medium. Some of the advantages of MANETs are lack of infrastructure, self-configuration, flexibility and scalability.

MANET's have little vulnerability like lack of centralized administration, no predefined periphery; cooperativeness and presence of adversaries in the network are some of the in MANETs. These weaknesses in MANETs are utilized by the aggressors to obtain secret data's and to break off the network process. Consequently, protection in MANETs becomes a necessary feature and security level gets varied according to with the application criticalness of the application. Military and defence operations necessitate extremely protected routing than conjugal demands.

The unpredictability of node movement results in dynamic routing and this result in need of incorporating the routing functionality into nodes. The set of connections throughout the network should be able to cooperatively amend the data routing paths to get rid of any of the course-plotting effects. Moreover, in a military environment, security preservation, steadfastness, deliberate jamming, and revival of failure are unique concerns.

RELATED WORKS

Recent security approaches are restricted by the attention of enforcing anonymity at a profound cost to valuable possessions since generates high traffic. Numerous methods cannot afford all of the confidentiality described above protections. ALARM [8] cannot defend the position anonymity of the nodes include source and destination; this protocol cannot offer route anonymity. Also, it lacks in providing security since it reveals their original ID to all other nodes in the network. ALERT [1] provides data confidential however it is notbulletproof for all type of active attacks. This protocol was designed by delivering low-cost computations and arbitration anonymity protection. MASK [3], novel anonymous routing protocols generate a significantly high cost, which aggravates the supply constriction difficulties in the network. This contract can be carried out using both MAC (Medium Access Control) layer and network-layer

by concealingnode's real IDs of the contributed nodes preventing from adversaries.

Anonymous Routing Protocol (ARM) [2] for MANET was proposed for hiding the routes in small broadcast groups and padding messages.ODAR: On-Demand Anonymous Routing in Ad Hoc Networks[6] was recommended to utilise a high-cost unidentified data path on a front line. However, low quality of service in tone and cartridge information transmission may lead to catastrophic events.

(AnonDSR) [5] was proposed to provide three levels of security protection such as sanctuary, anonymity, and scalability. A zone-based K-anonymity[10] routing protocol was introduced to provide destination anonymity. Here the data is swamped within the obscurity zone hence tracer cannot able to estimate the destination node.

AO2P[4] was proposed for communication anonymity here the position of the destination is exposed for route discovery. Recipient contention scheme is premeditated for formatting the subsequent hop, and Pseudo identifiers are used for data packet delivery once the route is established. However, revealing the destination ID might cause trouble. SDAR [11] a Secure Distributed Routing protocol guarantees security and anonymityby encrypting the direction-finding packet header for protecting the data from unreliable intermediate nodes. ANODR [7] an anonymous on-demand Routing protocol was proposed to prevent the real identities of local transmitters from the adversaries by providing routing anonymity. GPSR [9]Greedy Perimeter Stateless Routing takes forwarding decisionsusing router's immediate neighbour's information. Greedy forwarder in a packet is impossible if the packet reaches a region and the algorithm recovers by steering around the region perimeter.

PROPOSED MODEL

ALsSrR Protocol: In MANET nodes are arranged in a huge pasture where geographic routing is used for data transmission between the nodes for reducing communication latency. The attackers might receive network data packets passively due to its battery power and notice the deeds in their vicinity. Powerful nodes are many times pretend to be valid nodes and insert malicious packets. Every node deployed separately with the help of location server as well as source and destination nodes are picked randomly in the network. Since MANET has unpredictable routing path and the nodes are dynamic, it is hard to find reliable and confidential intermediate nodes.

Based on the location service the intermediate nodes are found between source and destination and the righteous path is estimated based on the node's capability. Once the location of the relay nodes is located, then their confidence level is evaluated using modular arithmetic calculation.

Anonymity Protection: Anonymous Location-supported with Self-reliance Routing protocol is proposed to offer the individuality as well as location anonymity of the source and destination for the apprehensive secure MANETs. ALsSrR protocol makes the route strenuous by selecting the intermediate nodes randomly and dynamically to discover apprehensive securedpath between the source and destination.Greedy Perimeter Stateless Routing (GPSR) is the routing protocol used in this proposed mechanism for forwarding the data from source to destination node since it provides anonymity protection.

The route anonymity due to arbitrary forward node selection in ALsSrR thwarts the trespasser from interrupting the packets from transmitting to next hop or negotiates the susceptible nodes from routing causesdenial of service attacks. The routes in MANET environment changes continuously during communication takes over between two nodes, so it is difficult for adversaries to predict the path of the next packet for packet interception. Also, the interaction between two specific hops cannot be changed or stopped uncertainly since the high number of nodes might be participated over the network as well as the number of packets to be transmitted might be considerable.

Modular arithmetic and Euclidean algorithm: The node ID's are kept confidential, and the data are passed over the anonymous nodes. The modular arithmetic operation is a public key encryption technique proposed here for implementing ALsSrR protocol. Modulo operator is defined as "*p mod n*" which is the remainder when n divides the value of *pn*. The result should be relatively prime to *n*. It is necessary to find secured and the righteous path from source to destination hence Euclidean algorithm is applied along with modulo operation for the intermediate node ID's. The node *p* and

node *q* are the source node and destination node. The Greatest Common Divisor is abstracted from the node ID's, and if common factors are obtained other than '1', then the nodes are defined as insecure then the other relay node is chosen. The modulo numbers should be without common factors (except 1). The Euclidean algorithm for computing GCD (p, q) is as follows

Input: Euclid (p, q) → Node ID (x, y)

Output: Uniqueness (p, q) → Euclid GCD (p, q)

Procedure

1:Begin

2: A = p; B = q

3: if B = 0; return A = GCD (p, q)

4: R = A mod B

5: A = B

6: B = R

7: else goto 2

8: end

Therefore the secured path is achieved through the calculation of standard factors using prime keys as well as the anonymity of the nodes is evaluated. Aggressor node needs exceptionally high computation supremacy to launch powerful attacks for decrypting as well as to find out the source of a session with an unambiguous destination. To hide the packet content from adversaries, Anonymous Location-Aided Routing in Suspicious Secure MANETs employs cryptography. Here MD5 hashing algorithm is used. Thus public key cryptography increases the computation cost compared to the symmetric security process, however, provides more security. Therefore ALsSrR protocol usespublic key encryption process for transmitting the data.

RESULTS AND DISCUSSIONS

The performance of the proposed system ALsSrR and the conventional MASK routing protocol are compared with each other, which is presented in this paper using simulation results. A scenario of 50 nodes randomly deployed in a rectangular area of 1000x1000m is shown in table 1 below. Since Random Way Point mobility model is used, the network area is not a limitation for the mobility of the nodes. To analyze the performances, the packet delivery rate, false are compared through simulations.

Parameter	Value
Simulation Time	100 ms
Number of nodes	50
Traffic model	CBR
Simulation Area	1000 x 800
Transmission range	250m
Antenna Type	Omni antenna
Mobility model	Two ray ground
Network interface Type	WirelessPhy
Channel Type	Wireless channel
Mobility Model	Random Way Point

PDR: Data packets received by the destination along with total send packets by source multiplied with some receivers and the ratio between this is termed as PDR (packet delivery rate). The PDR is calculated by the equation (6).

$$PDR = \frac{\text{Total Pack Received}}{\text{Total Pack Send}} \quad \ldots(6)$$

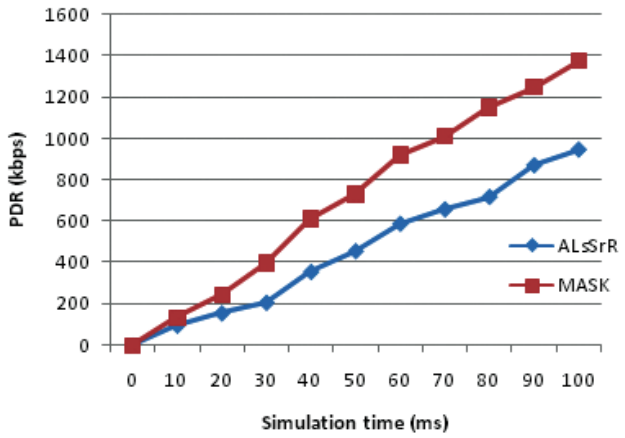

Figure 1: PDR of ALsSrR and MASK

Figure 1 shows that the ALsSrR mechanism shows higher packet delivery rate than MASK. This is because anonymous routing has improved packet delivery in the ALsSrR mechanism.

Detection Rate: Malicious node detection rate is the total correct malicious nodes detected to the actual malicious nodes present in the network. The ALsSrR has portrayed higher detection rate than the conventional MASK protocol. This detection rate is varied according to the number of experiments as shown in figure 2.

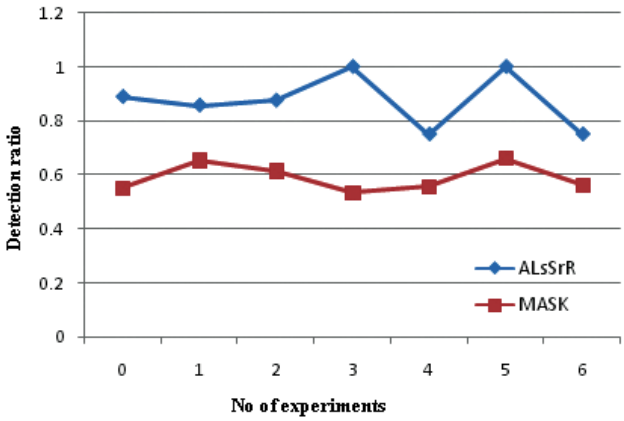

Figure 2. Detection Rate of ALsSrR and MASK.

CONCLUSION

Anonymous Location-Support and Self-reliance Routing (ALsSrR)protocol are proposed for secure packet transmission in MANET. This protocol is proposed for keeping the packets secured from adversary nodes and to provide message encryption for secure data forwarding. This contract includes anonymity protection for delivering node uniqueness which includes Modular arithmetic and Euclidean algorithm for providing node security. The MD5 algorithm is used for message encrypting and decrypting process. The performance evaluation is shown, and the efficiency is compared with both the conventional and proposed protocols. The mean node detection ratio is higher for the proposed protocol.

Ethical Clearance: Taken from Sri Sairam Engineering College

Source of Funding: Self

Conflict of Interest: L NA

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DOI Number: 10.5958/0976-5506.2018.00141.9

Big-Data Mechanism and Energy-Policy Design

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ABSTRACT

Investigation is building a digital framework stage to help multivariate representation of information gathered from conveyed sensor arrange. Three new strategies were presented in this stage: First, a half breed information reserving technique that takes favorable circumstances of an adaptable and appropriated time arrangement database, Open TSDB, to acknowledge productive information recovery. Second, a hyper-dimensional information 3D shape is set up to delineate interpret multivariate and heterogeneous sensor information into a typical information structure to help area mindful visual examination. Third, an information driven representation module is executed to help intelligent and dynamic perception on a recreated virtual globe. A Yet Another Resource Negotiator (YARN) leads to show the great time execution of the proposed framework. The appearance of cutting edge sequencing stages, which have significantly expanded the extent of small scale biomedical-related tasks, a few superior grouping examination pipelines are currently accessible to agents for smaller scale biomedical investigation. To anticipate the work will make an important commitment to both the representation building piece improvement in digital foundation examine and the headway of visual introduction and investigation of sensor information in area sciences.

Keywords: *Grid computing, TSDB, big data, Hadoop, locality alert visualization and hyper aspect data.*

INTRODUCTION

Profiting from the headway of present day Earth Observation Systems, gigantic earth perception information has been gathered from sensor systems and natural perception stations using sea floats, high recurrence radar, independent submerged vehicles, and so on. This far reaching accessibility of enormous earth science information turns into a basic building hinder towards setting up the cutting edge advanced earth framework, by which circulated earth perception information can be effortlessly, gotten to, broke down and adequately pictured. Information get to investigate tries to take care of the issue of gathering and overseeing dispersed earth perception information assets, and logical information representation expects to grow better approaches for displaying complex data to encourage learning disclosure. This is a key research range in the domain of Digital Earth, and is critically expected to help different natural examinations, including farming, air quality assessment, surge administration, and creature conduct ponders, among others. Unique in relation to remote detecting pictures, which are the primary information source in existing representation endeavors, sensor perception information are constantly found in various arrangements, sorts, measurements, sources and structures. An extraordinary normal for such information is that it is multivariate and space-time touchy. For example, NOAA's Integrated Ocean Observing System gathers atmosphere and ecological data from eleven dispersed sensor perception destinations over the US. These distinctive perception locales normally obtain an alternate arrangement of atmosphere factors, going from snow profundity and air temperature to mass centralization of carbon dioxide and sun oriented radiation.

The information is additionally gathered at various frequencies while a few stations gather information once every thirty minutes; others gather information once a day. This outcomes in heterogeneous information included distinctive structures and requiring diverse portrayal. Moreover, the measure of sensor perception information is expanding at an emotional speed, making enormous information challenges. As the Internet has turned out to be omnipresent for sharing earth perception information, extensive endeavors have been made to move representation devices from independent

applications to online situations. This exploration incline brings another test up as far as proficiently exchanging remote, huge earth perception information and the ongoing examination of this information. Customary information portrayals utilizing content, tables and different structures are demonstrating insufficient for investigating this information, particularly for geophysical marvels, the qualities of which fluctuate extraordinarily finished space and time. The quick advancement of equipment quickened realistic cards and PC vision strategies have empowered more successful portrayal and example extraction from substantial amounts of geospatial information. The development of the GI Science field and its subfield geo representation has enhanced the comprehension of the physical and social marvels on the Earth utilizing geospatial advancements.

GIS and geo representation go about as critical channels for revealing intriguing concealed examples. Multivariate representation extends conventional geo perception by coordinating spatial and non spatial information with cartography to help visual spatial examination. These representation procedures are more compelling in managing social connection information, for example, activity streams, in contrast with that acquired from dispersed sensor perception organize. In addition, the perception devices are for the most part independent applications, constraining their use and pertinence in taking care of sensor perception information conveyed in the internet.

Related Work: Ruiz et al. [1] discussed about a slight effect in execution could be created for this insertion; this is negligible and extremely hard to see in light of the fact that the programs are not equipped for handle such quick occasions. This is so on the grounds that the programs are vigorously reliant on a few layers, for example, the shader compilers, equipment engineering, realistic drivers, and so forth. Jackson et al.[2], the open doors for science to misuse these new improvements are additionally extremely noteworthy: not exclusively to approach numerous more unique perceptions about the earth from sensors and natives, yet in addition to include subjects in the development of logical confirmation and to close the hole amongst science and society. Fusco et al[3], tsdb performed drastically superior to anything MySQL, being additionally described by a slower pace while seeking on bigger records. With a specific end goal to see how a reserve influence comes about, between sections have put the time taken for instantly rehashing a similar inquiry utilizing an alternate space name. Campbell et al [4], it is not ordinarily feasible for an individual from the overall population to recoup what his or her neighborhood looked like at some subjectively characterized point previously, or to utilize a virtual globe to imagine what his or her reality will resemble, as far as urban development, environmental change, or ocean level ascent, sooner or later in view of the best logical displaying. Hauser et al [5] , the representation and investigation of information originating from multi run reproductions and communicating reenactment models as remunerating bearings for future research, and in addition multimodal perception. A test is to mutually incorporate bigger measures of simultaneous information volumes in the visual investigation, conceivably given on various matrices as well as with various information dimensionalities.

Yang et al. [6] the restriction in conventional SDI information revelation and actualizes some degree of mechanization to encourage logical investigation. The administration fastening motor, which consolidates a unified control stream design and a full control design, adjusts the adaptability in chain hub determination and the plan many-sided quality. Li et al. [7] the nature of metadata from various suppliers would impact the discoverability of the dataset even with a well-performing recovery framework. An open source geospatial internet searcher and coordinate the propelled methods into the flow well known metadata web crawler Geo system to profit the more extensive Digital Earth client group. Rey et al. [8], given a Hadoop stage used to this union assignment in the MapReduce worldview. To quicken this consolidation assignment, the reducers are arranged to pack its yield into GNU compress organize with the goal that information exchange between information server hub and processing hub is quick and the compacted records can be linked specifically. Cao et al. [9], expressed a focal access point where overall population or scientists can interface with physically appropriated information administrations, design the best system transmission demonstrate considering his/her equipment and system condition, see measurable data, and lead space time questions about remote datasets. Wlodarczyk et al. [10] shown that this zone is in a beginning period of the improvement. Right now OpenTSDB is developing as the most mainstream decision for time-arrangement stockpiling. This is for the most part

because of more non-exclusives and in the meantime more straightforward design can give it leverage in long haul unless additionally received by contenders.

Proposed System: The information motor is intended to recover and store perception information from conveyed sensor perception systems, for example, NOAA's System as a feature of the Incorporated Oceanic Scrutinizing System. These sensor systems give a web benefit interface, the Sensor Observation Service, which is agreeable with the Open Geo spatial Consortium standard subsequently cultivating the interoperability of sensor information utilizing YARN framework. To make consistent linkage between our information motor and the remote SOS server, capacities are produced to question sensor metadata, perceptions and the spatiotemporal portrayals of watched natural factors. What's more, a reserving system is set up to chronicle information that is procured remotely in the nearby information vault and significantly enhances the proficiency for information access and perception. A point by point portrayal about the plan of the neighborhood store is given. Figure.1 shows the workflow diagram of YARN framework.

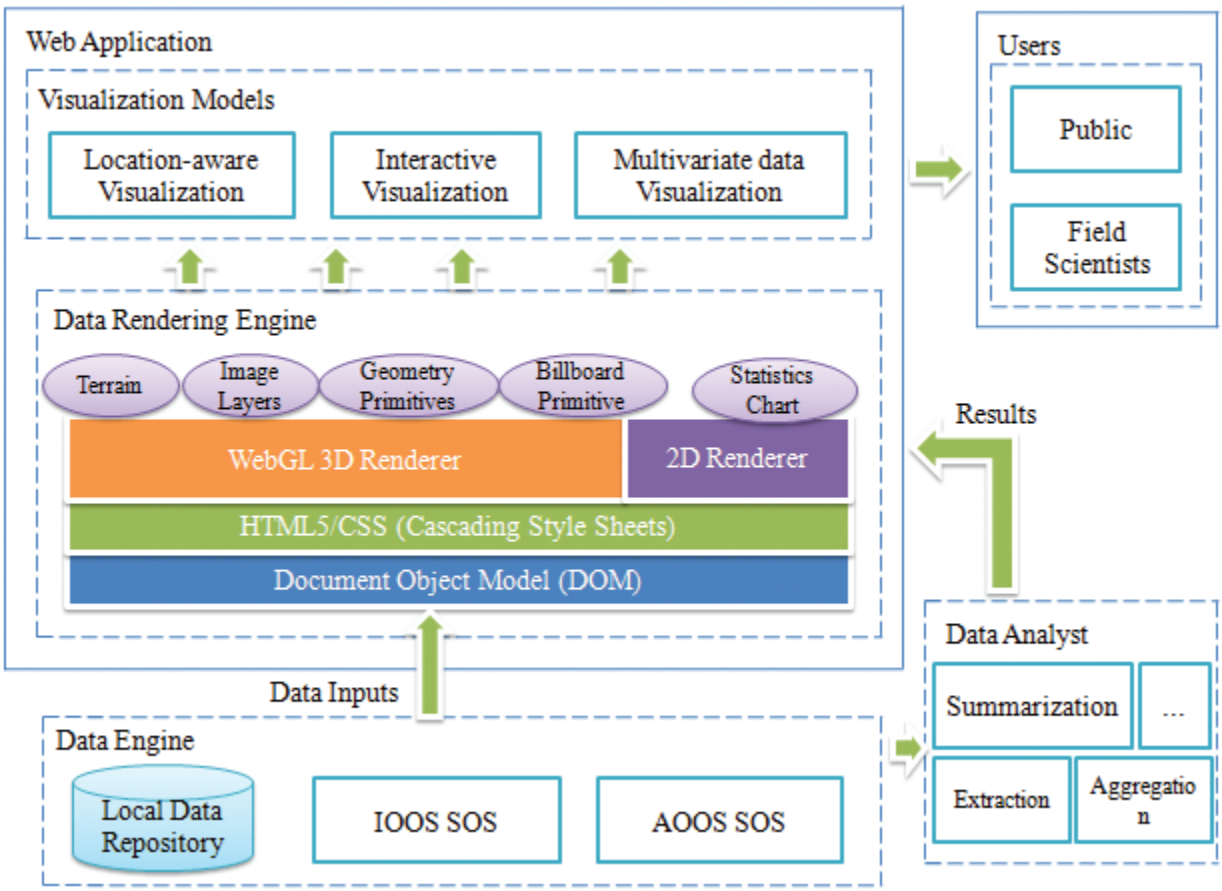

Figure 1: Work flow of YARN Framework

The information investigator discusses specifically with the information motor to help factual visual examination of the multivariate sensor information. Synopsis, extraction and decay operations are bolstered. Outline bunches multivariate information with comparative properties or those falling in a similar range. Extraction distils chose features of information from the multivariate information structure. Disintegration permits the disaggregated and more itemized perspective of multivariate information by navigating the multivariate information. These operations are empowered by a proposed information block display and are utilized to help various sorts' multivariate information representation, examined.

Over the information motor and the information investigator modules, there lays the web application compartment. Two center parts, the information rendering motor and the perception motor, are incorporated in the digital stage. The information rendering motor embraces a rising rendering procedure, WebGL, to control realistic gadgets and bolster 2D/3D rendering.

A noticeable component of WebGL is that it doesn't require the establishment of any module, required by most 3D outline motors, for example, Google Earth or NASA's World Wind. Another favorable position of WebGL is the arrangement of JavaScript APIs, which can be consistently coordinated with an assortment of two-dimensional measurable and representation libraries, for example, D3 (Jain 2014) to help intelligent and dynamic visual investigation on a three-dimensional globe. Three rendering primitives—picture, geometry and bulletin are accessible for 3D rendering in light of WebGL. The picture primitive is responsible for stacking static maps got from remote detecting pictures to reproduce the genuine landscape sort and land cover on the Earth's surface.

Managing Competence of Sensor Data: The raw observation data is always unstructured and heterogeneous across observing sites. Taking the AOOS as an example, they provide two ways for sharing collected data. One shares environmental variables and their values observed in different years through NWS' website as data tables. The second shares data collected in real-time through standard web interfaces, the OGC-compliant Sensor Observation Service. To speed up processing time to achieve better user experience and implemented a local caching mechanism to percept the required remote data in advance and download, parse and cache the data in the local data repository. This data perception strategy is formed according to a statistics of user requests and interests in the sensor network data. According to this principle, the following data request-response workflow is enabled. First, historical and real-time observation data is retrieved from the remote server. Two caching strategies are always adopted in previous works. One is partial caching, that means the system only caches dataset that a user has requested.

When the same dataset is requested by a different user, the data will be loaded from the local database rather than the remote server. This strategy has the advantage of reducing the storage pressure in the local repository and speeding up the user response time. However, if the requested data is not cached, a user must wait until the data is acquired from the remote server. In this case, there will normally a long wait. To overcome this limitation and at the same time propose a scalable full-site caching solution and introduced the use of a distributed time series database, to handle the caching of big observation data and at the same time to provide fast response time.

Assisting Multivariate Data Process: In spite of the fact that the effectiveness of information get to is enhanced by embracing neighborhood reserving instrument, there remains the issue of data asymmetry crosswise over individual tables as various stations gather distinctive condition factors at various frequencies. This disparity postures challenges for visual investigation and cross-station information correlation. Keeping in mind the end goal to deliver this issue and to control information consistently, an information 3D shape demonstrate is built up to reshape heterogeneous information and give a bound together information operation. Different information 3D square models have been proposed and executed in the writing, including the Polaris interface and the information 3D square based multi-scale representation. These model works shed lights on envisioning the spatialized sensor perception information, be that as it may, existing information 3D shape models concentrate for the most part on settling the representation difficulties of information living in social databases, rather than the current well known NoSQL database, for example, HBase.

This model uses an assortment of data summed up in three estimations variable, time and space to populate the data 3D square. The game plan of elements is serialized in the x estimation, time stamp in y estimation, and station in z estimation. Each station's data can be considered as data cut in the shape. Exactly when an examination request is posted, the data piece model will at first blueprint novel data from each watching site or station onto the proposed data strong shape. By then, extraordinary multivariate examination destinations, for instance, incline examination for multivariate data from a lone station, cross station data relationship and rundown estimations, can be capable upon the blend of 3D shape operations. There are five atomic data 3D square operations executed to help the online explanatory getting ready.

Result and Discussion: It is dependably an essential goal to accomplish high runtime execution in the outline of programming framework. Execution issues are likewise of specific significance to digital representation stages since remote information exchange the taking care of and rendering of vast measure of heterogeneous spatial information and other one of a kind difficulties, which don't exist in independent applications, can block a digital framework's effectiveness, responsiveness and the

visual impact. In the segment, the compelling execution of the proposed framework controlled up by the nearby storing component to help multivariate perception. As the sensor perception information changes by sensors, inspecting recurrence and fleeting perception length of natural factors, led a progression of analyses to look at execution contrasts accomplished by neighborhood reserving utilizing social database and the proposed time arrangement database and an immediate information ask for from remote sensor perception administrations when the asked for parameters shift.

The proposed YARN framework discovers the evaluation parameters such as execution time, energy consumption and accuracy to calculate efficiency of the proposed YARN framework and overcome the existing frameworks. In the YARN framework enhances feature classification of huge dataset. The framework estimates the execution time, energy consumption and accuracy.

Table 1 demonstrates the execution time, energy consumption and accuracy for input features with existing frameworks. Table 1 shows the average value of all estimation features with input parameters with 15 GB data size. The proposed YARN framework is estimated with following existing frameworks such as Big Data Maturity Framework (BDMF) and Axiomatic Framework (AF). Table 1 noticed that YARN framework has the best score on every specify features for frameworks.

Table 1: Comparison of execution time, energy consumption and accuracy

Frameworks	Execution Time (S)	Energy Consumption (kWh)	Accuracy (%)
BDMF	2650	25.6	60
AF	2435	22.1	71.64
YARN	2160	16.2	93.9

According to Table 1 estimations, it monitored the proposed YARN framework is estimated based on execution time, energy consumption and accuracy. Proposed YARN framework is computed with Big Data Maturity Framework (BDMF) and Axiomatic Framework (AF) frameworks behalf of execution time, energy consumption and accuracy. AF is the nearest challenger. It improves the classification of huge data. However, AF is provided with the less accuracy. A YARN framework enhances the classification execution time 275 seconds, energy consumption 5.9 kWh and accuracy 22.26%. Lastly, the paper declares the proposed YARN framework is best on all several features.

CONCLUSION

The paper acquaints a YARN framework stage with help productive multivariate perception of natural information from sensor perception systems. This stage embraces new representation procedures, including area multivariate perception, hyper dimensional information cubing, and neighborhood reserving, to empower exceedingly intelligent, natural, dynamic and elite perception. In particular, the area multivariate perception connects the show of multivariate sensor information with the real landscape reenacted on a virtual 3D globe to improve the comprehension of the area of ecological changes. The hyper dimensional information cubing bolsters the adaptable mapping and change of heterogeneous sensor information gathered at various areas and at different inspecting frequencies into an institutionalized information show. This is proficient utilizing an assortment of web based handling operations cut, dice, and rotate, bore up and penetrate down to effectively extricate the subset and distinctive aspects of multivariate sensor information from the information archive. To enhance the runtime execution, a neighborhood storing system is incorporated to permit productive preprocessing of the sensor information in requirement for perception. This nearby reserving effectively isolates the tedious information recovery from the representation procedure to accomplish remarkable framework execution

Ethical Clearance: Taken from Mahendra Engineering College

Source of Funding: Self

Conflict of Interest: NA

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DOI Number: 10.5958/0976-5506.2018.00142.0

Data Mining Approach: Distribution of Retinal Plasma Liner Handling Image Processing for Automated Retinal Analysis

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ABSTRACT

Computed Aided Diagnosis (CAD) methods are highly used by the medical professionals in the field of medical image analysis. Many retinal diseases like retinopathy, occlusion etc. are identified through the changes occur in the retinal vasculature of fundus images. Detection of glaucoma at early stages is essential to avoid the sight-threatening retinal disease. In this paper, the data mining techniques based on retinal image analysis by means of blood vessel segmentation done by the image processing method is discussed in this paper. The work involves the steps like channel separation from the input images and the Optic Disc (OD) segmentation by means of the Fuzzy C-Means (FCM) algorithm, followed by the extraction of features from the segmented images. Now the data mining steps like feature selection and the classification process are done by using the K-Nearest Neighbor (KNN) classifier is expressed. The performance accuracy of glaucoma detection is obtained at the maximum of 97.2%.

Keywords: *Retinal, Glaucoma, Fundus, FCM, KNN classifier.*

INTRODUCTION

Retinal blood vessel segmentation is achieved by assigning each pixel as either a vessel pixel or non-vessel pixel. The retinal vessel segmentation methodologies can be seen in different dimensions. The orientation of multi-scale scoring followed by application of vessels filter and is tested over the HRF image data is explained in [1]. The methodology could also handle the vessel crossings and the bifurcations as against the vessels filter which looked only for elongated structures.

The vessel segmentation method can be divided into two types such as pattern-based recognition, and rule-based techniques are discussed in [2]. The methods involving the building classification models for categorization of the pixels and clustering models for grouping of pixels as either vessel or non-vessel pixels are under the pattern recognition based techniques. Also, the matched filtering, vessel tracking, multi-scale techniques, mathematical morphology and model-based techniques are under the rule-based category.

A self-adaptive MF that is the synergistic combination of vessels and matched filter is discussed in [3]. During the broad spectrum, the approaches of the filter based methods are based on the intensity of the image and are in homogeneity to the susceptible images. Also, the issues that are occurred suing he enhancing of vessels in different scales, it gets combined with some other method to increase the performance of the segmentation.

The analysis of glaucoma by means of the optic cup and optic disc segmentation from the monocular colour retinal images is explained in [4]. The information of the local images is found around the point of interest during the multidimensional feature space for OD segmentation. The method based on the analysis of glaucoma by the empirical wavelet transform and correntropy features are discussed in [5]. The empirical wavelet transforms used for the decomposition of the images sub bands, and the features like correntropy are extracted and are used as the inputs for the classifier for classification of glaucoma.

An automatic diagnosis of glaucoma using the retinal fundus image is discussed in [6]. Various types of colour spaces and the stochastic watershed transformation make use of the anatomical characteristics of the blood vessels and the optic nerves to find out the glaucomatous and the regular fundus images. The detection of glaucoma using the Haralick texture features with the

digital fundus image is discussed in [7]. The GLCM features are extracted from all the 13 Haralick features. Then the K-Nearest Neighbour classifier is used for the classification with the help of the GLCM features.

CDR and ISNT features are utilised for the conclusion of glaucoma in [8]. It employs different morphological operations for the optic cup and disc segmentation and furthermore for the blood vessel extraction. Glaucoma is recognised by utilising cup to-disc area ratio, and vertical cup-to-disc ratio for the segmentation of the optic disc is done by LBP [9]. The histogram equalization is used for quality improvement of the fundus image, and then the LBP features are extracted from the red channels of the fundus image.

SYSTEM DESIGN

In the section, an efficient data mining techniques based on retinal image analysis by means of blood vessel segmentation done by the image processing method retinal image classification system is proposed in this paper. Figure 1 shows the framework of the proposed system. The Figure 1 explains how the system works in image processing based data mining process for the retinal fundus image classification. Here the system is divided into two phases as such image processing and the data mining phase. The image processing phase consists of channel separation from the input image followed by the OD segmentation using the FCM algorithm and then from the group of the clusters the Gray-Level Co-Occurrence Matrix (GLCM) features are extracted. Then the feature selection phase consists of the feature selection by genetic algorithm and the classification of the selected features using the KNN classifier scheme.

OD Segmentation: The optical disc segmentation is done by means of the Fuzzy C-Means algorithm to segment the OD regions from the separated channel image. The FCM algorithm is a type of the clustering algorithm that usually assigns the membership of each data point corresponding to more than one group based on the distance between the data points and the cluster centres. Where the number of data is near to the cluster centre more is its membership towards the particular cluster centre. The degree of membership for each item is given by a probability distribution over the clusters.

Feature Extraction: After the segmentation of the optic disc from the separated channel image using the FCM algorithm, the features are extracted by from the segmented images. In this system, the GLCM feature has been extracted. GLCM is the basis for texture features [10]. The GLCM usually characterizes the image by calculating the specific values of the pixel pairs and the spatial relationship that occurs in an image. By this, the GLCM is created and is features of the statistical measures are extracted from the corresponding matrix.

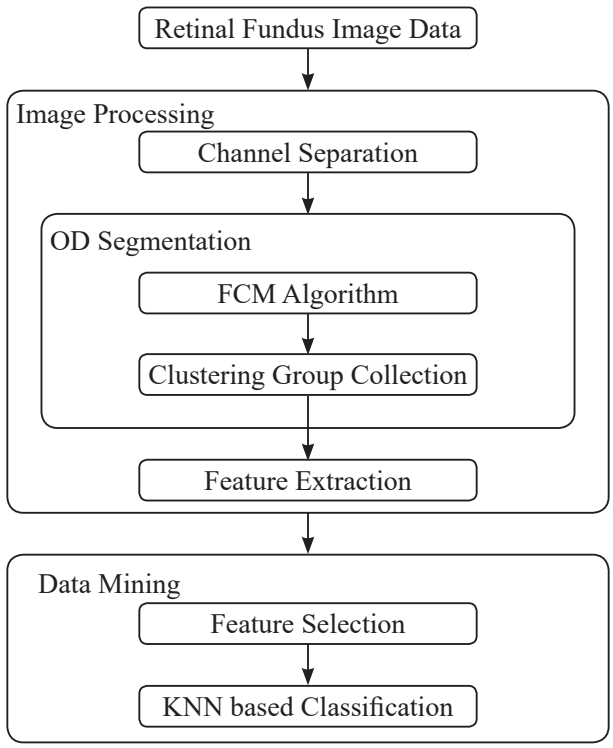


Figure 1: Framework of the proposed system

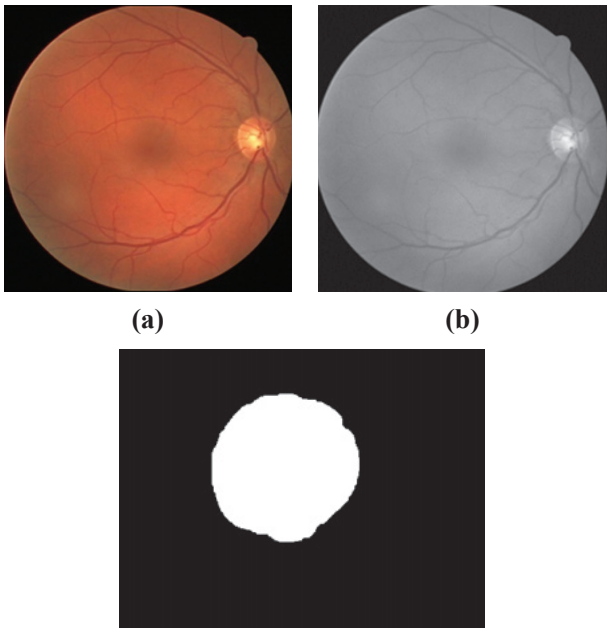
Feature Selection: In the paper, the data mining steps are carried away using the features selection process algorithms. Here the algorithm used for feature selection process is the genetic algorithm method. The genetic algorithm is usually a part of the data science competition. It is used for solving both the unconstrained, and the constrained optimisation problems occurred in the natural selection process. At first, the algorithm selects the individuals from the current population randomly and then uses it as a parent for producing more population. The population increases over successive generations over the optimal solutions. Finally, the selected feature data's are given as the inputs for the classifier.

KNN Classification: The data classification can be executed successfully by the type of the classifier scheme used. The classifier scheme used in this proposed system is the KNN classifier scheme. The KNN classification is performed by identifying the nearest K neighbors of

the selected feature data values. Then the K neighbors vote on the classification of each unknown data with its corresponding new data values. Each vote may be counted equally, or more priority may be given to votes of the closest neighbours. It computes the Euclidean distance between the known and the unknown data values.

RESULTS AND DISCUSSION

The performance of the proposed data mining based retinal fundus image classification system is tested by using the HFR dataset images. Here from the input images, the green channel separation is done from which the OD segmentation is done by means of the FCM algorithm. The segmented output image is as shown. Figure 2 shows the OD segmented output images.



(a) (b)

(c)

Figure 2: (a) Input retinal fundus image (b) Green channel separated image (c) OD segmentation by FCM image

Table 1: Output accuracy of the proposed data mining based image classification system

Image	Classification Accuracy (%)
Image 1	97.5
Image 2	97.5
Image 3	96.4
Image 4	97.5
Image 5	97.9
Image 6	93.2
Image 7	98.2
Image 8	95.6
Image 9	96.5
Image 10	96.5

The above figure shows the output images of the OD segmentation algorithm, and from that image, the GLCM features are extracted and are used in the data mining steps to perform the classification. Then among the number of features, the genetic algorithm selects only some specific features that are satisfied by the feature selection algorithm. Finally, the KNN classifier scheme collects all the data's from the above steps and analyze them and gives the output of the system. Some of the image segmented images are used for the classification, and the obtained accuracy values are shown in Table 1.

CONCLUSION

In this paper, a data mining techniques based on retinal image analysis using blood vessel segmentation done by the image processing method is discussed and is explained. In this paper the image processing phase is carried away by using the OD segmentation process using the FCM algorithm, then the features are extracted that will be given as the input to the feature selection steps. Then the data mining phase is carried by the features selection and the classification algorithms. The performance of the system is tested by the HFR datasets and the output accuracies obtained at the data mining phases are shown in the table. The highest classification accuracy obtained by our method is 98.2 %

Ethical Clearance: Taken from Mahendra Engineering College

Source of Funding: Self

Conflict of Interest: NA

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DOI Number: 10.5958/0976-5506.2018.00143.2

Design and Implementation of RTO's Based Multitasking Street Light

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ABSTRACT

The proposed system can optimize the management and efficiency of street lighting systems. It also uses a sensor combination to control and guarantee the desired system parameters. Embedded system is a main domain of this project. Embedded system is a combination of hardware and software integration. Internet of Things (IoT) is connected to high tech street lighting system. RTOS is defined as real time operating system. It is used for multitasking purpose. A real time operating system is necessary to handle the timely events and other multitasking requirements of the project. FreeRTOS is used to reconfigure the system, for example first enable the Ethernet task, Web server task and next enable the sensor task.

Keywords: *RTOS, Street Monitoring, JPEG, Camera and Ethernet*

INTRODUCTION

A Street-light is the main source of light on the road side or intersection of roads or walkways, which determines the high-tech standard of roadways communication of a city or a country [1]. In existing system describes that the remote streetlight was monitoring and auto controlling system. The system can be set to run in automatic mode, which control streetlight according to Sunrise and Sunset Algorithm and light intensity [2]. This control can make a reasonable adjustment according to the seasonal variation. This street light system also includes a time cut-out function, when vehicles pass by, the light will turn on automatically, later turn off. This design can save a great amount of electricity compared to streetlamps that keep alight during nights [3]. In this existing system focused on street light controlling and monitoring system using without internet. Furthermore, this system has used to find out the damaged light [4-5]. The system can be widely applied in all places which need timely control such as streets, stations, mining, schools, and electricity sectors and so on. The core of the system is constructed based on the Microchip's PIC16F microcontroller. In proposed system fully focused on RTOS based multitasking street lighting system using IoT[6].

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SYSTEM ARCHITECTURE

The project aim is to design an intelligent high tech street lighting pole that runs an embedded web server to provide smart web based services [7-8] to people living on the street in addition to the energy efficient lighting management services and other emergency handling facilities. This smart lighting system shows in Figure 1 can be implemented in cities, streets, campus, parks and sporting venue. The unique features of the project are described below.

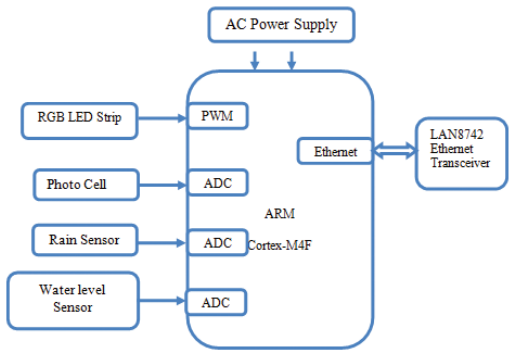

Figure 1: Street Lighting System

Rain and flood Monitoring: Rain and water level sensors are integrated within the pole-SAT system to provide warning alert to the people in the street as well as government authorities during heavy rain and flood situations.

RGB LED light: LED based street lights consume least amount of power. Here the lighting in Pole-SAT system have RGB colour LEDs [8] RGB LED means Red Green Blue Light Emitting Diode. Brightness of the light can be varied from 0 to 100% with LED technology[9].

Photocell control: The Street light is automatically turned on and turned off during night and day. This is controlled by a photocell sensor, measuring light intensity in that region.

RESULTS AND DISCUSSION

Figure 2 shows that the implementation of street lighting system. A monitoring system based on the embedded Internet technology for street light is designed and implemented. Embedded system is fully based on hardware and software. In this proposed system depends on ARM Microcontroller[10]. ARM Microcontroller has an Ethernet port. Ethernet provides a fast, efficient, and direct connection to a router. Its counterpart, Wi-Fi, is used for wireless connection. A reason would use Ethernet over Wi-Fi is to achieve a faster, more reliable connection.

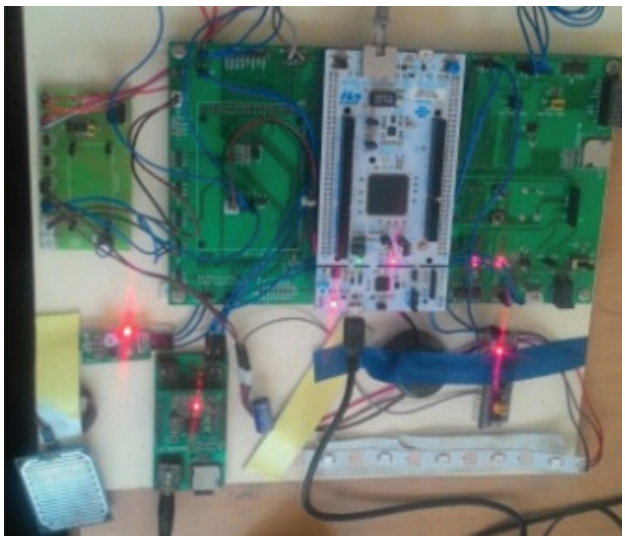

Figure 2: Hardware Implementation

In this high tech street lighting system consists of rain sensor, water level sensor, photocell control and RGB LED. Rain sensor used to find out the rainy time. Water level sensor is detects the flood. Photocell sensor used to control the light for example in day time automatically street light is off and night time the street light is automatically on. In this sensor data sends to the web server through Ethernet.

CONCLUSION

The project aim is to design an smart high tech street lighting pole that runs an embedded web server to offer smart web based services to people living on the street in addition to the energy efficient lighting management services and other emergency handling facilities. In this proposed method of smart lighting system can be implemented in cities, streets, campus, parks and sporting venue. In this street lighting system used to measure the parameters like flood level and rain monitoring. Main advantages of this project are used to monitor the internet through Ethernet. The discussed system is particularly suitable for street lighting in urban and rural areas. In this high tech street lighting system very flexible, efficient and power saves system.

Ethical Clearance: Taken from Sri Venkateswara College of Engineering

Source of Funding: Self

Conflict of Interest: NA

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DOI Number: 10.5958/0976-5506.2018.00144.4

Developing Indian Sign Language Recognition System for Recognizing English Alphabets with Hybrid Classification Approach

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ABSTRACT

Generally speaking and hearing are two simple practices of communication. The deaf and dumb people experiences difficult to communicate with normal people. To resolve this difficulty Indian Sign Language (ISL) recognition system is developed. Our Indian Sign Language system uses both hand gesture image and NAM (Non-Audible-Murmur) speech to enhance accuracy of recognition system. From input image hand sign feature are taken by DWT (Discrete-Wavelet-Transform) after preprocessing. And from NAM speech features are taken by MFCC (Mel-Frequency-Cepstral-Coefficients).In this work we implemented fusing the image and audio features and as well as fusing the classification techniques for better recognition. We used HMM (Hidden-Markov-Model) and ANN (Artificial-Neural-Network) for classification. The experimental results shows maximum average recognition rate as 70.19 % of the ISLR system while fusing sign image and NAM features with ANN classifier, 79.72% with HMM classifier and 88.84% while fusing classifiers.

Keywords: *Sign language recognition, hand gesture, NAM microphone, ANN and HMM*

INTRODUCTION

Communication is the course of info and sharing opinions from one to another. It gives a people sending observations, information and emotion to a people. To achieve good communication need of common medium language. When normal people communicate to deaf and dumb, problem arises. They could not hear or speak with normal language, so they need a method to transfer or express their thought and emotions. The sign language is a vital communication method to people who suffer hearing and speaking disability. In modern times, many methods are aimed for sign language recognition using human signs(hand, head and upper body gestures).In Indian sign language recognition single and double handed gesture images with camera is discussed in [1]. But in our experiment we are using single handed sign or gestures.

What is Sign Language? Sign language is a language which uses visually transmitted gesture or sign patterns to express meaning. It is the combining hand orientation ,shapes and movement of hands, arms or body, and facial expressions. Sign languages are not international. Every country has its own unique sign language. For Example, American Sign Language (ASL) having its own rules and grammar -it is not a visual form of English. Sign language is unique for every nation [2].Arabic, Bangla, and Malay, Taiwanese, Chinese, Japanese, Spanish and etc. has their own sign language. There are approximately 70 million people with hearing deficiencies in the world [2]. And mobile phone for voice communication also an issue for deaf and dumb people. NAM speech recognition is modern technique to recognise dumb speech. NAM Speech is a Non-audible murmur (NAM) is an unvoiced speech that could be received through the body tissue by a special microphone (NAM microphones) attached behind the speaker's ear.[3]Several investigators experimented NAM speech recognition of Indian English alphabets to text.

RELATED WORK

In video based sign language translation, sign data set were collected from the deaf and dumb persons then recognizing the words individually by capturing the frames and it will be converted to sentence[4] and then system processed individual words to form a meaningful sentence with the grammar rules. Arabic sign language

recognition system is implemented in by using Adaptive Neuro Fuzzy Inference System (ANFIS) .Sign image denoising is done using median filter and iterative thresholding is used to segment the hand sign , smoothed by Gaussian smoothing[5]. Panikos Heracleous examined for detecting NAM speech in Japanese vocabulary. They had conducted research for recognizing NAM speech using a stethoscopic and silicon microphone and they achieved a high level of accuracy for around 20000 Japanese vocabulary task. In their further research on NAM using hidden markov models (HMM) [6]. Sign recognizing by using Frames of a video of a sign. Extract face and hand components of a signer to extract facial feature by local centroids of the extracted components along with the global centroid are exploited to extract spatial features [7].Sign recognition system implemented in portable android in which Computer image techniques were used for image analysis and Principal component used for recognition[8].

Umang Patel & Aarti G. Ambekar were investigated Indian Sign Language Recognition; they used two languages for a character and words (English & Hindi). Feature extraction by moment technique and gray level co-occurrence matrix and PNN & KNN are used. Also performance accuracies are contrasted in two classifiers[9]. In sign language recognition, signs or gestures are recorded by camera and inferred into meaning. Developing a recognition system without hand gloves and sensors, only by capturing the sign gesture actions rapidly and converting them into voice. This provides communication easy for deaf and dumb people. The above said method could be implemented in single and double hand, with series of gesture and translated. Hemina Bhavsar and Dr. Jeegar Trivedi done a review on various Classification Methods in Image based Sign Language Recognition System. Leap Motion, kinect sensor, Data glove and vision based are various methods for sign image acquiring i.e. input[10].

The popular classification methods used in sign language recognition in vision based methods are:

(a) Artificial Neural Network (ANN)

(b) Hidden Markov Model Hidden Markov Model (HMM)

(c) Support Vector Machine (SVM)

(d) Scale Invariant Feature Transform (SIFT)

(e) K-Nearest Neighbors (k-NN)

Artificial Neural Network is inspired by the biological nervous system. This neural network used to recognize hand sign from image. ANN has of a number of interconnected neurons processing electrons working to solve problems or decision making. Feed forward and back propagation algorithms are available in ANN. In general back propagation algorithm used for sign language recognition. Hidden Markov Model is a set of finite states associated by transitions. Each state has two sets of probabilities. They are transition probability and discrete probability. A state is associated with a probability distribution. In a specific state an outcome or observation could be generated according to the related probability distribution. The observation not the state visible to an external observer so it is named as Hidden Markov Model. HMMs are employed to test or find the gestures by parameters from the training data.

Support Vector Machine almost similar neural network. The two approaches are one against one and one against all. Separating hyperplane, maximum margin hyperplane, soft margin and the kernel function are some models for optimal usage of SVM classifier. Scale Invariant Feature Transform classifier provides reliable recognizing among different views of the same object, image classification and object recognition. A sign image is recognized in a new sign image by individually comparing all features and finding candidate matching features based on Euclidean distance. K-Nearest Neighbor classifier classify sign image or gesture by its neighbors with the image being assigned to the class most common among its k nearest neighbors. This classifier is an instance based classier which stores all possible cases and classifies new classes based on a similarity measure. KNN needs calculation distances between test pattern and all parameters in training group. The distance metrics are Euclidean ,city block, cosine and correlation.

SYSTEM DESIGN

The Indian Sign Language Recognition System is implemented with two types of inputs, hand gesture images and NAM speech. These two features are investigated separately using ANN and HMM classifiers. And both features are fused analyzed with ANN and HMM classifiers for experiment study. Finally classifiers (ANN&HMM) are fused for sign image feature and NAM speech feature independently as well as combined. The system flow diagram shown in Fig 1.

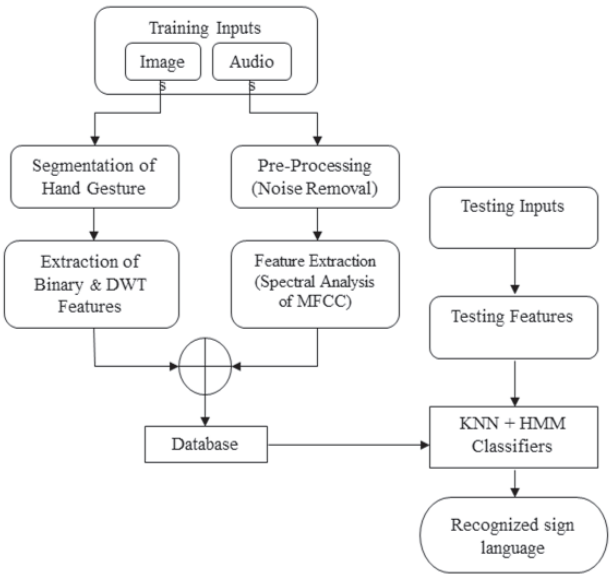

Fig. 1: System Flow Diagram of ISLR system

Feature Extraction from Hand Gesture Images: The input sign gesture images for all 26 alphabets converted to grayscale as part of preprocessing for effective processing. From the input image required hand area is segmented by otsu thresholding. Then feature is made as bounding box to fetch the feature. For further in segmentation the morphological operations applied. Finally we got the segmented requires image from input sign image. From the segmented image input ,sign or gesture feature will be extracted by binary feature and Discrete Cosine Transformation (DWT). Several level of DWT decomposition applied to get better features. Initially features are extracted from samples and trained, resultant feature are stored in database for testing and classification [11].

Feature Extraction from NAM Speech: The input NAM speeches for all 26 alphabets are recorded by our self-designed stethoscopic based NAM microphone. Then all signals sent to de-noising to filter unwanted noise in speech signals. Mel-Frequency-Cepstral-Coefficients(MFCC) used to extract features from NAM speech.NAM speech signals are applied Fourier transform which gives frequency spectrum ,mel filter applied to spectrum and then cosine transform taken for all spectrum , finally the amplitude gives mfcc spectral features. It contains several information such as bandwidth, shape of vocal tract and spectral energy[12].

RESULTS AND DISCUSSION

English alphabet hand sign or gestures images recorded by using C170 Logitech 5 MP digital camera. Signer wore a dark colour dress to differentiate hand sign or gesture from background area. In our work 100 sample for each alphabet collected. For NAM speech recording, our self-designed stethoscope based microphone used. First case, the Indian Sign Language Recognition experimented by using ANN classifier. NAM speech features extracted and tested independently which gives 58.88% of accuracy. Similarly sign image feature extracted and tested independently which gives 65.68% of accuracy. Finally features (NAM & sign image) are fused and tested which gives 70.19% of accuracy. Table 1 shows statistics of above said.

Second case, the First Indian Sign Language Recognition system experimented by using HMM classifier. NAM and sign image feature gives 62.58% and 77.29% of accuracy respectively. Fused feature gives 79.72% of accuracy. Table 2 shows this. In last case, classifier is fused.NAM and sign image feature gives 65.04% and85.07% of accuracy respectively. Fused feature and fused classifier gives 88.84% of accuracy in Table 3.

Table 1: Recognition Rate of the ISLR system fusing feature with ANN classifier

Input Alphabets	NAM Signal	Hand gesture images	Fusion of features	Input Alphabets	NAM Signal	Hand gesture images	Fusion of features
A	64	61.8	75.2	N	60	65.8	67
B	58	69	65	O	57	71.4	73.6
C	55	61.2	62.4	P	56	66	61.9
D	56	67.2	73.5	Q	60	65.6	65
E	58.2	61.8	77	R	57.8	68	69
F	57	63	70	S	55.2	67.4	73.4

Contd…

G	63	65.2	68.2	T	65	70	75
H	56.2	69.4	81.6	U	58	57	64.2
I	62.6	67	63.4	V	59.6	66	73
J	58	69.8	68.2	W	57	65	61
K	59.8	61.2	77.4	X	59	67.2	67
L	66	63	72.7	Y	56.4	68.2	68.2
M	58	65	78	Z	58	65.6	74
				Average	58.88	65.68	**70.19**

Table 2: Recognition Rate of the ISLR system fusing feature with HMM classifier

Input Alphabets	NAM Signal	Hand gesture images	Fusion of features	Input Alphabets	NAM Signal	Hand gesture images	Fusion of features
A	64	73	75	N	63	75.2	73.4
B	60	71	72	O	59.2	82	84
C	58	83.4	85.6	P	58	75.4	75.4
D	61	78.6	82.5	Q	65	79	82.8
E	60.2	75.6	77	R	59.8	75.8	79
F	59.8	77.4	78.6	S	63.6	75.6	75.6
G	66	71	72.2	T	68	76	78.8
H	59.2	74.2	83.9	U	62	81.6	83
I	66	83	85	V	66	81	85
J	72	72.4	75	W	59	77	78.4
K	65.2	73.4	74.2	X	63	82.6	85.6
L	67	78	82.2	Y	59	79	84.8
M	61	74	78	Z	62	84.4	85.6
				Average	62.58	77.29	**79.72**

Table 3: Recognition Rate of the ISLR system with fusion of ANN and HMM classifier

Input Alphabets	NAM Signal	Hand gesture images	Fusion of classifier	Input Alphabets	NAM Signal	Hand gesture images	Fusion of classifier
A	64	88	92	N	66.6	86	88
B	65	87	90	O	62.8	87	96
C	64.4	87	89	P	66.4	92	94
D	66	82	95	Q	65	82	87.8
E	68.6	81	86.56	R	68.8	86.8	88
F	63	80.6	82.4	S	64.6	93	97
G	60.2	80	86.4	T	68	79	81.2
H	67.8	93	94	U	62.4	85	86
I	64.6	86	88	V	64	83	88
J	63.8	80	87.54	W	63.6	79.6	85.9
K	67.6	85.6	87	X	65	86	89.8
L	62.6	82	85	Y	69.6	81.8	84
M	64.6	90.2	92.6	Z	62	88.2	88.6
				Average	65.04	85.07	**88.84**

CONCLUSION AND FUTURE WORK

In this research Indian Sign Language (ISL) recognition system is developed which uses both hand gesture image and NAM (Non-Audible-Murmur) speech to enhance accuracy of recognition system. We experimented fusing of NAM and Sign Image features with ANN & HMM classifiers independently. And system is investigated with fusing of features with fusion of classifiers .Further this work has to be planned to continue to develop a complete Indian English Sign Language system which covers words, sentences and real time translation

Ethical Clearance: Taken from Sri Sairam Engineering College

Source of Funding: Self

Conflict of Interest: NA

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DOI Number: 10.5958/0976-5506.2018.00145.6

Development of RTOs Based Internet Connected Baby Monitoring System

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ABSTRACT

This paper focused a web connected baby monitoring that streams live camera videos and very important data concerning the encircling setting and creates it out there on the online. This helps the parents to watch the baby from anyplace at any time, whether or not within the next area or off from home. The device is often unbroken physically at a secure distance off from the baby. All the parents must to do is to own a connected device like a Smartphone or a computer with a web browser. There's no must to install and maintain a separate mobile app. The device acts as an online server associated connects to the net over a local area network affiliation. The microcontroller runs on high of associate RTOS to attain this.

Keywords: *RTOS, Child Monitoring, JPEG, Camera and Ethernet.*

INTRODUCTION

There are a few solutions out there in the market today like baby alarm devices that use microphones to transmit sound and devices such as movement monitors that use sensors [1] placed under the steal mattress. But all of these devices are inherently limited in the transmission distance range and must be placed physically close to the baby [2]. These devices typically use wireless connectivity, which is not a viable option considering the safety of the baby. Children safety has always been a critical issue. The casualties of children may increase dramatically when parents or guardians are absent [3]. Therefore, the image/video based household monitoring/alarming system becomes a commendable supplement to the children care. In this paper, camera based monitoring system has been presented, which employs motion tracking technology and production system principle [4-5]. The system can monitor and track the children's state, evaluate the danger level of the children and make proper reaction to the dangers, i.e. by triggering the alarm and launching something necessary to avoid the bad consequence [6]. The library is employed for image and video processing and obtains the information on the motion, location and situation of the children. Experimental results show that this monitoring system can recognize the basic motions of the children and make proper actions according by the rule base. Due to its advantages of low-cost in hardware and fast response, the monitoring system can be employed as a supplementary in children care[7-8].

Incorporating the motion tracking technology into the production system principle provides more possibilities in children's monitoring for their parents. This household monitoring and alarming system [9] delivers improved performance, in terms of a low-cost auxiliary system. However, more works need to be done in the future, i.e. effective image processing methods to distinguish between the different body parts and predict/distinguish the behaviour or tendency of the children [10]. In consideration of the overall system performance and cost, we believe that the system can deliver invaluable benefits in monitoring the safety of the children.

SYSTEM ARCHITECTURE

Our project is a web connected baby monitoring that streams live camera videos and very important data concerning the encircling setting and create it out there on the online. This helps the parents to watch the baby from anyplace at any time, whether or not within the next area or off from home. Figure 1 represents the hardware model present in the project.

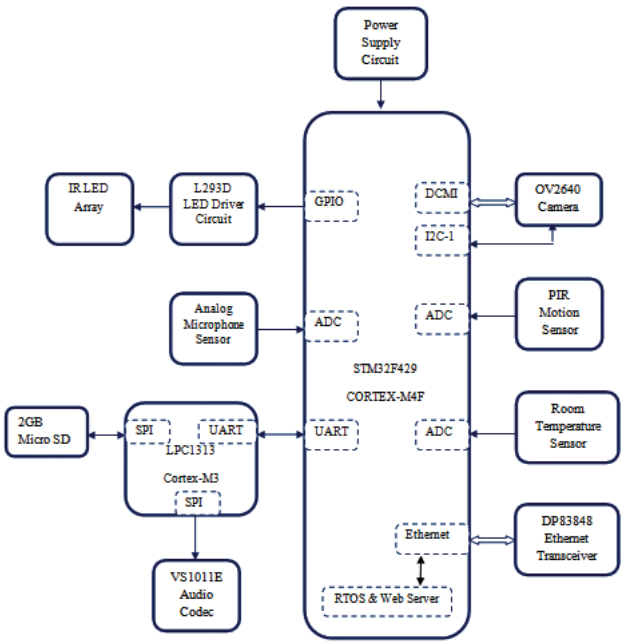

Figure 1: Hardware Module

Live MJPEG Video Streaming: The device is in a position to stream a transparent live video feed. once request is formed the aboard microcontroller captures the JPEG pictures from the camera persecution the inherent DCMI peripheral and starts to stream it over the online in Motion-JPEG compression format at a suitable rate between ten and 15fps . The image resolution is fastened at either 470 × 272 or 640 × 480. The microcontroller incorporates a giant RAM memory space, concerning 256KB, that may be a should for this sort of application.

Sound and Motion Detection: The device consists of an electro-acoustic transducer sound sensing element to find explosion and PIR sensing element to find any unwanted motion. The standing of this sensing element data is offered on the online page for the parents to determine.

Temperature Alert: The parents will see the temperature of the nursery live and can be ready to establish once the area is just too hot or too cold [10]. This may assist them to take care of the area at an ideal condition to stay the baby as safe as attainable.

Lullaby Playback: The device will store four mild lullabies within the memory card and an inherent speaker. Parents will play any of those lullabies to create the baby a happier one.

Night Vision Mode: An array of IR LEDs driven by a high current driver circuit provides the visual modality capability. This feature helps the user to ascertain the baby each throughout day and night.

Password Protection: Before connecting with the device the user must enter the login username and password that may be a lot of required security live to stop others from accessing the content. Once logged in, the user is currently absolutely ready to access all the options of the device as well as the video feed.

Local watching while not Internet: Even once a web affiliation isn't out there, the user will monitor the baby if his/her mobile device exists on an equivalent network because the baby camera device is connected.

Web Server: The device acts as a small internet server responding to the user requests through protocol application layer protocol. Here the online browser on the mobile device acts the consumer. Upon receiving the request from the consumer, the online server running on the device serves the HTML webpage and returns the respond messages to the consumer over a TCP/IP connection. The online pages area unit hold on within the non-volatile section of the microcontroller memory space. The device uses the LwIP open supply TCP/IP protocol stack for its net property.

RESULTS AND DISCUSSION

A real time package is critical to handle the timely events and different multitasking needs of the project. Here FreeRTOS is chosen to supply USA with this ability. FreeRTOS is that the market leading real time package within the world. Figure 2 represents the hardware implementation. Table 1and Table 2 shows the connection details of the hardware interfacing and device status.

Table 1: Connection Details

Peripheral	Detail
STM32F429IG	Connect Jumper in J3(vertical)
Power	5v Power Supply <----- USB (or) 5v Power Supply <------Adapter
LM35	connected to AIN14 (INPUT-3.3v,GND-GND,OUTPUT-PF10
Analog Microphone Sensor	connected to AIN14 (INPUT-5v(DB),GND-GND(DB),OUTPUT-PF4)
PIR Sensor	Connected to AIN15 (INPUT-5v(DB)

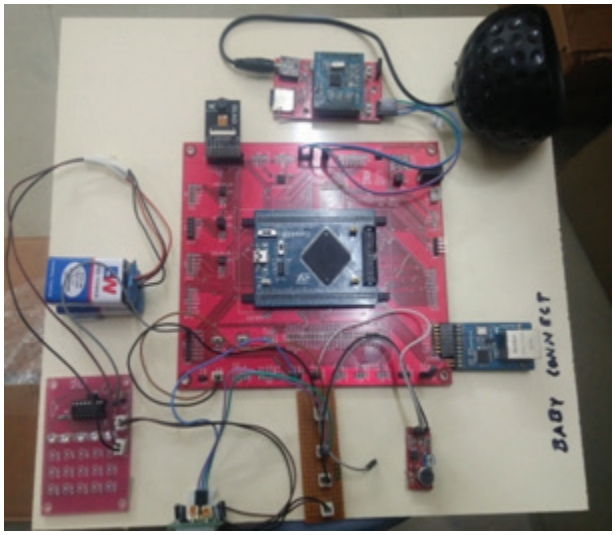

Figure 2: Hardware Implementation

Project Demonstration Procedure:

1. Connect the one end of the USB cable in the STM32F429 connector and the other end of the USB cable in the USB port of the CPU.
2. Switch ON the power supply of the STM32F429 in USB mode.
3. The LED 1 in the STM32F429 board will ON, it intimates that the STM32F429 board and the Computer are connected with each other through USB cable.
4. Change the TCP/IPv4- IP address in Connected PC.
   IP Address: 192.168.1.1
   Subnet mask: 255.255.0
   Default gateway: 192.168.1.100
5. Open Internet Browser in PC, type URL place in 192.168.1.100, Next log in Username with password.
   Username: admin
   Password: secret
6. A window will open; it consists of three modes, 1.internet camera, 2.device status, 3.device control.
7. Internet camera mode used to show the live Streaming video.
8. Device control mode used to control the following operations.
   (i) None button after press send button.
   (ii) Song1, Song2.....Song N, after press send button.
   (iii) Pause button after press send button.
   (iv) Resume button after press send button.
   (v) Low volume button after press send button.
   (vi) High volume button after press send button
   (vii) Night vision on button after press send button
   (ix) Night vision off button after press send button

Table 2: Device status mode

Name	Status
Temperature	Normal/Alert
Sound	Normal/Alert
Motion	Normal/Alert
Music	Running/Off
Night vision	On/Off

Features:

- High immunity to external noise
- Higher in cost-performance
- Custom design is available
- High stability with temperature changes
- Slight movement can be detectable.
- High sensitivity and excellent S/N ratio

CONCLUSION

Wireless Video monitoring technique is used for baby monitoring system. Existing systems convey video information through a manifest file and start video streaming with a special data format video phase; subsequent video segments rely on the manifest file and data format segment for playback. In distinction, the video segments convey essential knowledge through their name and may be opposing severally, i.e., every individual phase is absolutely playable while not relevancy the other file or phase. This file independence implies the video capture and video file phase creation and streaming by a miniaturized video acquisition/ sensor node.

Ethical Clearance: Taken from Sri Venkateswara College of Engineering

Source of Funding: Self

Conflict of Interest: NA

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DOI Number: 10.5958/0976-5506.2018.00146.8

EMR a Scalable Graph-Based Ranking Model

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ABSTRACT

Recently, Content-Based Image Retrieval (CBIR) has received a great consideration by researchers. It becomes one of the fascinating topics in image processing and computer vision. In this paper, Gray Level Co-occurrence Matrix (GLCM) is employed which is widely adopted for efficient image feature description and simplicity to extract the features from the separated image. Before the extraction, RGB component is separated. To describe the colour images, it is required to combine the GLCMs from each channel of the image. Finally, K-Nearest Neighbor (K-NN) is employed for applying Euclidean distance to retrieve the image. Experimental results show a significantly higher retrieval accuracy compared with previous research.

Keywords: *CBIR, GLCM, K-NN Classifier.*

INTRODUCTION

Over the years a variety of features are defined and intended to capture distinguishing characteristics in an image and enabling CBIR system. Performance evaluation of image retrieval systems using wavelet transform based shape feature is discussed in [1]. Wavelet decomposition using morphology operators, threshold and Local Binary Patterns (LBP) is done. Performance of the system is compared using average precision.

Local Bit-plane Decoded Pattern (LBDP): A feature descriptor for biomedical image retrieval is described in [2] . Local bit-plane transformed values are computed for each pixel from the bit-plane binary contents of its every neighbouring pixel using local bit-plane transformation scheme. By finding a binary pattern, an introduced LBDP is generated using the difference of centre pixel's intensity value with the local bit-plane transformed values.

Multi-object face recognition using CBIR is presented in [3]. There are three steps are involved such as feature extraction, clustering, detection and recognition. A different method is used in each step that is LBP, Euclidean distance and agglomerative hierarchical clustering. A comparative study of texture descriptor analysis for improving CBIR is introduced in[4] . Study of texture analysis methods that permit the selection of an appropriate combination of descriptors for CBIR. Tamura technique, Log-Gabor filters and co-occurrence matrix is the most common descriptors in texture retrieval are found. These three descriptors are very influential for CBIR systems.

Multilevel Haar Wavelet Transform (HWT) and histogram usage in CBIR system are explained in [5] . A hybrid approach of features is used such as texture and colour is presented. A colour histogram is used to extract the colour feature and HWT is used to extract the texture feature. The grouping of these features is robust to scaling and translation of objects in an image.

Texture features and similarity fusion based document image retrieval is implemented in [6] . Feature extraction is done by using statistical approach by local binary texture method and transform-based approach by wavelet analysis technique and two feature vectors are obtained for each document image. Weighted average fusion is employed for classifier fusion technique to use the properties of both features. At last, document images are ranked based on the greatest visual correspondence to the query obtained from the fusion similarity measures.

CBIR using ranking model is discussed in [7] . Shortcomings of manifold ranking are addressed from two important perspectives such as competent ranking computation and scalable graph construction. Particularly, anchor graph is built on the database instead of a customary K-NN graph, and a form of the adjacency matrix is designed to speed up the ranking.

CBIR using local and global features descriptor is described in [8] . The novel descriptor is used to describe the whole image in the case of global features called upper-lower of LBP based on LBP. Whereas, interest points are extracted by local features using scale-invariant feature transform algorithm.

Weighted fusion of LBP and circular covariance histogram features for effective CBIR is discussed in [9] . These features are efficient for describing the content of the image texture and the image but it has limitations in defining the overall image content when individual features are used. Image retrieval using features in spatial and frequency domains based on block-division is explained in [10]. Retrieval accuracy is improved by using block division method by adding geometric information. The image area is divided into regions relating to the image blocks.

Transform and spatial feature level fusion based efficient CBIR is presented in [11]. Fusion of 2D complex dual tree Discrete Wavelet Transform (DWT) and LBP is used for feature extraction from YCbCr image as it gives better frequency and spatial resolution. Non-separable real-valued multidimensional DWT is implemented.

A variety of edges and points are detected efficiently using LBP texture descriptor. Large-scale image retrieval using LBP and iterative quantization is introduced in [12]. The efficiency of learning binary code is improved by improving the suitableness of the hashing algorithms inputs using LBP in extracting image features.

METHODS & MATERIALS

Gray Level Co-occurrence Matrix: A co-occurrence matrix or distribution is a matrix that is described over an image to be the sharing of co-occurring pixel values. The spatial relationship of pixels is considered by examining texture is the statistical method called as Gray Level Co-occurrence Matrix (GLCM) and also known as grey-level spatial dependence matrix. Figure 1 explains the processing steps of **Gray Level Co-occurrence Matrix**

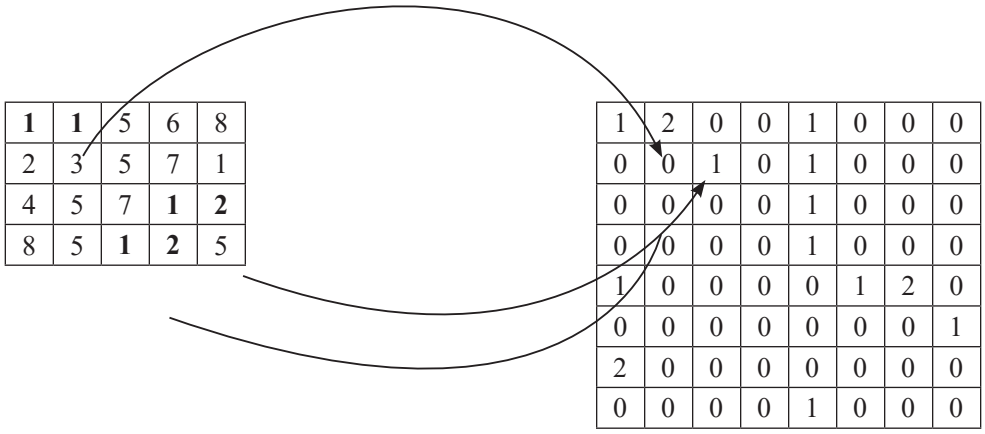

Figure 1: Process steps to Design Gray Level Co-occurrence Matrix GLCM

The texture of an image will be characterized using this GLCM functions by calculating how frequently pixel pairs with exact values and in a particular spatial relationship occur in an image, creating a GLCM, and then extracting statistical measures from this matrix. Several statistics can derive from them using the graycoprops function after creating GLCMs. Information about the image texture is obtained by these statistics.

K-Nearest Neighbor: Training samples generate the classification rules of KNN themselves without any supplementary data. Category of test samples is predicted by KNN classification algorithm according to the K training samples which are the nearest neighbours to the test sample, and evaluate it to that category which has the main category probability. Determine the category of a known query based not only on the document is the basic idea that is nearest to it in the document space but on the categories of the k documents that are nearest to it.

PROPOSED SYSTEM

The proposed approach includes two sets, training and testing. In the training set, primarily, the texture features are extracted from the whole image by applying the GLCM method. In the testing set, similar extraction techniques employed in training set is used for a given testing image to characterize the query image.

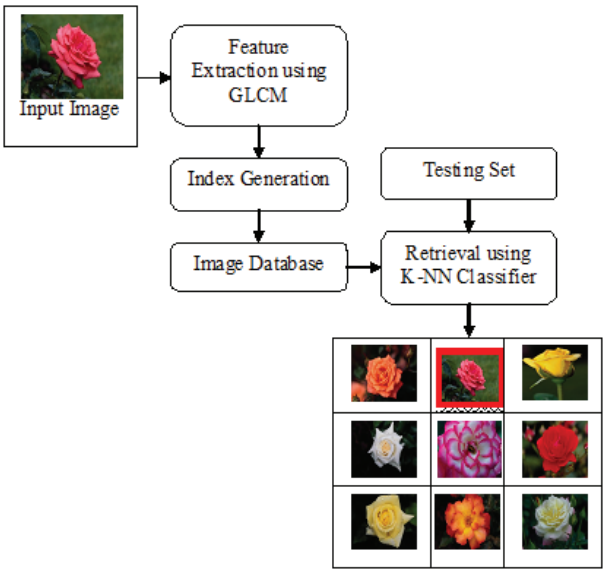

Figure 2: Proposed System Architecture

Similarity distances between the features extracted from the query image and the information based on knowledge obtained during the training phase are computed for every feature. Next K-NN classifier is employed for the retrieval process. Finally, the relevant image(s), which have a maximum visual comparison to the query image, is retrieved as a result. Figure 2 shows the architecture of the proposed CBIR Process.

EXPERIMENTAL RESULTS

In the paper, comparison of the proposed method with the state of the art methods is compared in survey chapter. Before the extraction RGB colour components are separated from that separated components, GLCM technique is applied to each component for feature extraction. Extracted features are stored in a database for the classification purpose. In testing set, the same process is employed like training set. Finally, both the training and testing sets are given as input to the K-NN classifier to retrieve the images. High efficiency is obtained using this proposed CBIR method. The efficiency of the retrieval namely accuracy is calculated for colour images from the image database. Accuracy of the proposed system is defined by the following in equation (1)

$$\text{Accurayc} = \frac{\text{Precision} + \text{Recall}}{2} \quad \ldots(1)$$

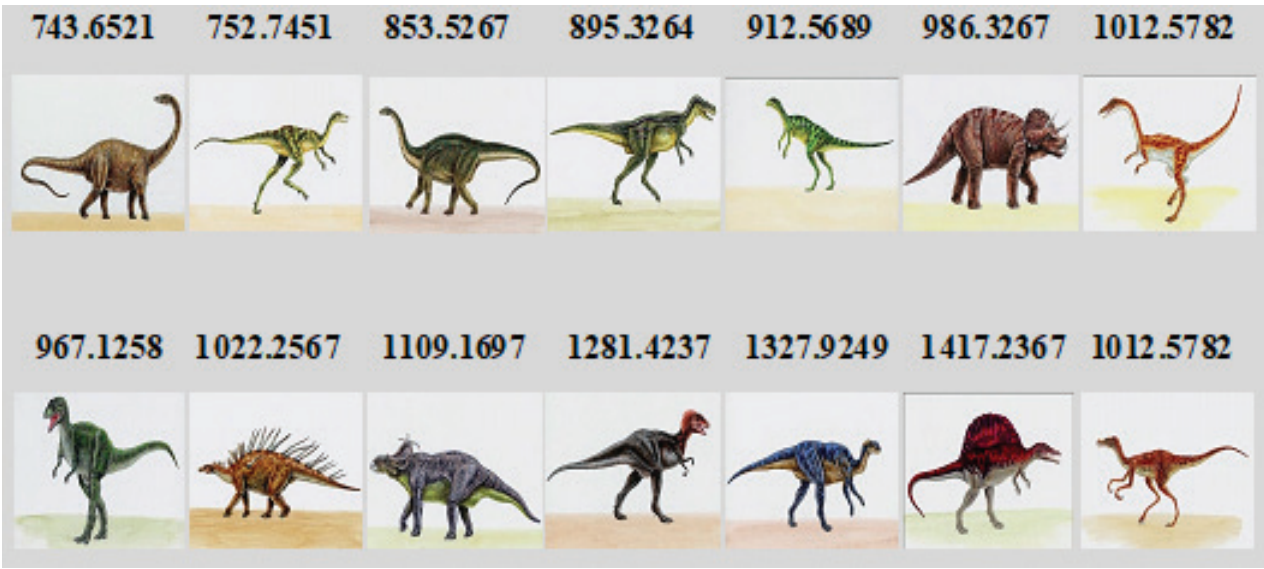

Fig. 3: Retrieval Results of Dinosaur

Results of the proposed CBIR using GLCM feature technique is shown in the Figure 3. It is evident from the experimental outcomes which are shown in the above figure that has higher recall and precision. Average recall and precision performance is lower in case of some classes like horses and mountains. The results of the methods are shown in the form of recall and precision of every class.

CONCLUSION

Image retrieval using GLCM feature extraction and K-NN classifier is presented in this article. Relevant features are extracted after converting input RGB image into separated RGB components. Extracted features are given as one of the input to the classification stage while at the same time testing images are also given. Database

used in the system is Wang database Corel images of sizes 384×256 and 256×384 and the precision of the method is 91.2%. The experimental result shows that the method can attain a development in terms of precision over the existing methods.

Ethical Clearance: Taken from Mahendra Engineering College

Source of Funding: Self

Conflict of Interest: NA

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DOI Number: 10.5958/0976-5506.2018.00147.X

Energy-Efficient and Corrective Algorithm for Improving Stability in Wireless Sensor Networks

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ABSTRACT

Wireless Sensor Network will get wide materialness and acknowledgment if enhanced vitality effective routing convention is executed. The greater part of the cluster based hierarchical routing conventions utilize base station as the principle controller to choose cluster heads which expands vitality utilization and round outing time delay. In long-remove transmission, Multi-Hop methods are favored. Despite the fact that MH limits the measure of vitality cost devoured by every hub along the way however finding the ideal routing way between hubs is still exceptionally intriguing issues. This paper proposes Energy-efficient and corrective algorithm for improving stability (ECAIM) based on Dijkstra algorithm. Energy is given prior importance. The energy consumption at the transmitter and receiver has been merged to model the weight of the link between nodes. Network simulator is used to evaluate ECAIM in comparison with other conventional algorithm based on Dijkstra under various scenarios of network models.

Keywords: *wireless sensor network, dijkstra algorithm, network simulator, stability, energy consumption.*

INTRODUCTION

Generally, little estimated and low-control sensor nodes have been sent for the advancement of sensor network innovation. Wireless Sensor Network (WSN) additionally comprises of modest, low power, little memory and low calculation fit sensor nodes. All these sensor nodes of WSN are disseminated in the irregular or deterministic way in remote spots or present day urban areas. The fundamental capacity of a sensor hub is to gauge the adjustment in the detecting territory and to pass the detected information to the sink hub. As sensor nodes have a little power source, it requires vitality proficient steering convention to decrease vitality utilization and enhance WSN lifetime.

Directing procedure assumes a crucial part in sparing nodes' vitality. Thus, dependable and vitality productive directing convention turn into the main focus on that is looked for by all specialists. Ordinary steering systems can be grouped into two principle classes; coordinate transmission and multi-jump transmission. Roundabout transmission, every hub sends its information specifically to the base station. Since the transmission cost increments exponentially with separate, consequently a lot of energy is depleted by a long shot nodes. This prompts the over the top deplete of their energy. To beat this issue, multi-bounce transmission is utilized. In multi-jump, nodes work agreeably to hand-off information to base station. Thus, the aggregate separation is parceled into little parts. In spite of the fact that multi-bounce methods consistently appropriate the cost between the nodes, the base vitality utilization isn't generally ensured. In this way, the aggregate cost may be more noteworthy than that circuitous transmission.

RELATED WORKS

To keep up the idleness and vitality secured information transmission, the super edge structure is essential with MAC convention. PON-based structure adjusts the system movement and limits the system estimate [1]. A bunching calculation in light of an inactive optical system (PON) framework was presented where optical line terminal was comparable to individual region organize organizer, and optical system unit executes as the group head. Utilization of a PON framework to a sensor system can prompt a proficient united system on the grounds that a PON framework can incorporate a vast sensor organize where a great deal number of hubs are conveyed over the wide territory. On the off chance that

the vast system is merged on a solitary PON framework, at that point the administration of the framework turns out to be extremely productive and financially savvy[2].

In LEACH, the system rounds are reasoned to draw out the system lifetime, and it expands the throughput. Filter convention is likewise utilized for stack adjusting on systems. This convention is additionally utilized for the information conglomeration in the multi-bounce organizes [3]. Vitality Efficient Clustering Algorithm for Event-Driven Wireless Sensor Networks (EECED) went for drawing out the lifetime of a sensor arrange by adjusting vitality use of the hubs. EECED influences the hubs with more leftover vitality to have more opportunities to be chosen as the group head. Voter hubs assume the liability of gathering vitality data of the closest sensor hubs in choosing the bunch head[4].

In this paper, the emphasis is given on concentrate the connection between vitality utilization and jumps number and furthermore gives a determination foundation of the problematic bounce number under viable sensor system to limit the vitality utilization. Bounce based Energy Aware Routing (HEAR) calculation was proposed which is dispersed and limited [5]. Drain (Low-Energy Adaptive Clustering Hierarchy) uses randomized revolution of nearby bunch based station (group heads) to equitably disseminate the vitality stack among the sensors in the system. Filter utilizes confined coordination to empower versatility and vigor for dynamic systems and fuses information combination into the steering convention to lessen the measure of data that must be transmitted to the base station. Filter can disseminate vitality scattering equitably all through the sensors, multiplying the helpful framework lifetime for the systems[6].

Judging metric characterizes vitality effective intra-bunch transmission and this metric is called limit remove which is abused in deciding ideal group estimate. In light of the ideal group measure, unified vitality mindful lattice bunching convention was outlined [7]. Power-mindful directing methodology utilizes a novel connection metric which accomplishes the best exchange off between control utilization inside the hub and its jump separation to the sink. It depends on a changed Dijkstra's calculation which decides the topology of the system while playing out the figuring of slightest way costs[8].

An Unobservable secure routing scheme offers complete unlinkability and content unobservability for all types of packets. This protocol is efficient as it uses a combination of group signature and ID based encryption for route discovery [9]. In Decentralized distributed Space Time Block Coding (Dis-STBC) system, the knowledge about the Channel State Information (CSI) is not available at the transmitter[10].

PROPOSED SYSTEM

Dijkstra algorithm is utilized for finding the briefest way between two vertices in a diagram. Most limited way algorithm has been broadly utilized as a part of systems steering. Let G (V, E) be a coordinated weighted chart having an arrangement of vertices. It is affirmed that minimal separation between any two hubs is the straight line which associated them; henceforth it isn't worthy to think about the physical separation as the heaviness of connections between hubs. Along these lines, we are worried about evaluating the heaviness of edges. We need to take the vitality cost, not the physical separation as the heaviness of edges. The main objective is to increase the stability of the network (i.e.) the time before the death of the first node. The proposed ECAIM scheme is explained in Figure 1. The steps in ECAIM consist of the following: initialization phase, set-up phase and steady-state phase.

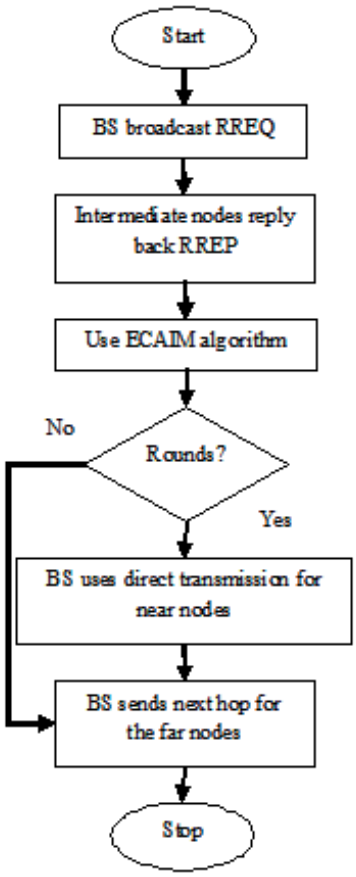

Figure 1: ECAIM scheme

Initialization phase: Initially, there is the large number of nodes deployed in the communication network. All the nodes communicate with other neighbour nodes directly in the network. To communicate with farther nodes in the network, the source uses intermediate nodes to communicate the data and send it to the destination. Source broadcast Route Request (RREQ) data to forward the data. The next intermediate nodes that receive RREP will reply a Route Reply (RREP) message towards the source. The data packet contains node's identification number, location dimensions and the initial energy level. The base station uses the local information to classify these nodes according to the distance from the base station into groups (near and far nodes). The nodes that are within the communication range are termed as near nodes, and that is away from the communication range are called the far nodes.

Set-up phase: This stage is relegated for ideal ways estimation. BS misuses the hubs' data about areas and vitality levels to set up the weight matrix of the system as clarified already in BEEMH. At that point, it utilizes Dijkstra ventures to appraise the ideal information course for every hub. When the courses for all hubs are determined, BS will declare the outcomes to the related hubs. Every hub develops its steering table and updates it with its next jump hub. For assist forthcoming rounds, the directing table for remote hubs is refreshed. Then again, the contiguous hubs will utilize DT for rest of the system activity; consequently, their steering table would not require a refresh. This, obviously, limits the setup cost of the contiguous nodes.

Steady-state phase: This stage is relegated for ideal ways estimation. BS misuses the nodes' data about areas and vitality levels to set up the weight matrix of the system as clarified already in BEEMH. At that point, it utilizes Dijkstra ventures to appraise the ideal information course for every hub. When the courses for all hubs are determined, BS will declare the outcomes to the related hubs. Every hub develops its steering table and updates it with its next jump hub. For assist forthcoming rounds, the directing table for remote hubs is refreshed. Then again, the contiguous hubs will utilize DT for rest of the system activity; consequently, their steering table would not require a refresh. This, obviously, limits the setup cost of the contiguous nodes.

SIMULATION ANALYSIS

The performance of the proposed scheme is analysed by using the Network Simulator (NS2). The NS2 is an open source programming language written in C++ and OTCL (Object Oriented Tool Command Language). NS2 is a discrete event time driven simulator which is used to model the network protocols mainly. The nodes are distributed in the simulation environment. The parameters used for the simulation of the proposed scheme are tabulated in Table 1.

Table 1: Simulation parameters

Parameter	Value
Channel Type	Wireless Channel
Simulation Time	100ms
Number of nodes	50
MAC type	802.11
Traffic model	CBR
Simulation Area	900×900
Transmission range	250m
Network interface Type	WirelessPhy

The simulation of the proposed scheme has 50 nodes deployed in the simulation area 900×900. The nodes are communicated with each other by using the communication protocol User Datagram Protocol (UDP). The traffic is handled using the traffic model CBR. The radio waves are propagated by using the propagation model two ray ground. All the nodes receive the signal from all direction by using the Omni directional antenna. The performance of the proposed scheme is evaluated by the parameters packet delivery ratio, packet loss ratio, average delay, throughput, residual energy and lifetime.

Packet Delivery Rate: The Packet Delivery Rate (PDR) is the rate of the number of packets delivered to all receivers to the number of data packets sent by the source node. The PDR is calculated by equation (1).

$$PDR = \frac{\Sigma_0^n \text{ Packets Received}}{\Sigma_0^n \text{ Packets Sent}} \quad \ldots(1)$$

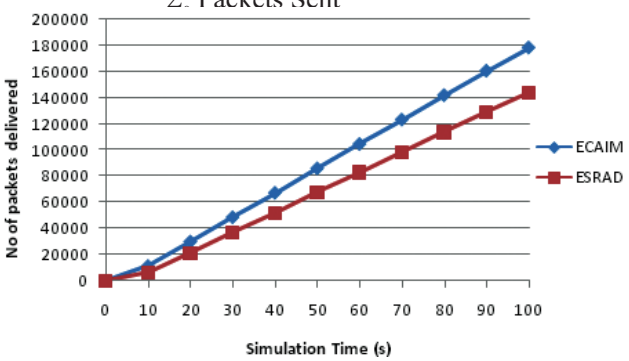

Figure 2: Packet delivery Rate

From Figure 2, the PDR of the proposed scheme is increased by 18% compared to the existing scheme ESRAD. The greater value of PDR means the better performance of the network protocol.

Packet Loss Rate: The Packet Loss Rate(PLR) is the rate of the number of packets dropped to the number of data packets sent. The formula used to calculate the PLR is calculated in equation (2).

$$PLR = \frac{\Sigma_0^n \text{ Packets Dropped}}{\Sigma_\wedge^n \text{ Packets Sent}} \quad \ldots(2)$$

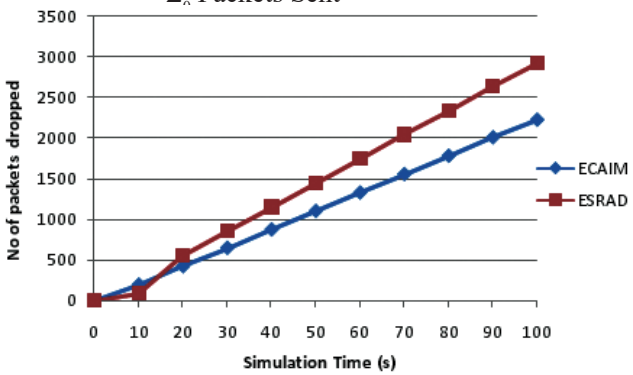

Figure 3: Packet Loss Rate

The PLR of the proposed ECAIM is lower by more than 11% compared to the existing ESRAD in Figure 3.

CONCLUSION

Energy-efficient and corrective algorithm for improving stability based on Dijkstra algorithm is proposed in this paper. Energy is given prior importance as it mainly deals with the consumption and remaining energy of the network. The energy consumption at the transmitter and receiver has been merged to model the weight of the link between nodes. Network simulator is used to evaluate ECAIM in comparison based on Dijkstra algorithm to show the performance of the proposed network.

Ethical Clearance: Taken from Sri Sairam Engineering College

Source of Funding: Self

Conflict of Interest: NA

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DOI Number: 10.5958/0976-5506.2018.00148.1

Estimation of Sample for Data Mining of Alliance Policy

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ABSTRACT

There is expanding enthusiasm for sharing the experience of items and services on the web stage, and online networking has opened a route for item and specialist co-ops to comprehend their customers' needs and desires. In the paper investigates audits by cloud purchasers that reflect customer's encounters with cloud services. The audits of around 6,000 cloud benefit clients were broke down utilizing conclusion examination to distinguish the disposition of each survey, and to decide if the feeling communicated was sure, negative, or impartial. The examination utilized two data mining devices such as RapidMiner and KNIME, the outcomes were thought about. To Create four expectation models in the investigation to calculate the reaction of client's reviews. The proposed method depends on four directed machine learning calculations: K-Nearest Neighbor (k-NN), Naïve Bayes (NB), Random Tree (RT), and Random Forest (RF). Based on Experimental evaluations, proposed algorithm improves accuracy 7.82%, and reduces Error Rate 7.82% of the proposed framework contrasted than previous classifiers.

Keywords: *Cloud Services, Data Mining, Reviews, KNIME, RapidMiner, K-Nearest Neighbor (k-NN), Nave Bayes, Random Tree, and Random Forest.*

INTRODUCTION

In the course of recent years, online client's surveys have assumed a critical part in giving helpful item bits of knowledge. There are different areas in which clients audits are vital, for example, inns, eateries, retail outlets, carriers, and other Internet-related services. As of late, there is an expanded request via web-based networking media, for example, web journals, dialog discussions and audits and it has been seen that people and associations are progressively utilizing the substance in these media [1]. There are some outstanding organizations, for example, Amazon, Google, Twitter, and TripAdvisor that have gathered an extensive accumulation of surveys and the investigation of the gathered information to remove review and sentiment is a testing undertaking [2]. Nowadays, a man needing to purchase an item through internet business is exceptionally dependent on other clients' conclusions before a buy choice is made[3]. These reviews may be sure or negative, and for any association, it is practically difficult to extricate a supposition by perusing every one of the audits.

So as to address this issue, data mining assumes a key part in removing the tone and opinions of shoppers. Data mining, which is otherwise called notion investigation, is the way toward removing people group's estimations about specific substances [4]. There are different applications, for example, neighborliness, film (motion pictures), tourism, and online business, which have advanced the requirement for programmed assessment mining [3]. Data mining is helpful to potential clients as well as to associations, to enhance their client service and client encounter. In the examination, client's audits on cloud services are utilized. Around 6,000 buyer surveys on cloud services were downloaded from the www.bluepagesdataset.com site [5]. The main role of this examination is to perform archive level notion investigation utilizing KNIME and RapidMiner, and to find the most appropriate programming for data mining. An actualize prescient classifiers like k-NN, Nave Bayes, Random Tree, and Random Forest and look at the exactness between those models.

RELATED WORKS

Web innovation and cloud services assume an essential part in the expansion and achievement of web based business. Cloud services enable an association to

extend their business worldwide and offer them offices to constantly improve their services. Nonetheless, business on the Internet varies from customary business since it is difficult to track online clients and assess their own advantages. People groups shared involvement and surveys of the items and services they utilize are of intrigue on the grounds that an immense scope of people is affected by these audits while picking an item or service [6]. Various speculations exist in the writing with respect to the utilization of people groups shared involvement to assess and comprehend customer sees on an item or service they have utilized. The latest cases of this sort of research have focused on audits separated from web-based social networking or online stages about different online services[7] [8] [9].

Data mining, assessment examination, and highlight investigation are utilized as terms in the paper to talk about procedures which can be utilized to comprehend the enthusiastic tone of the mutual audits. Data mining is the prime concentration of this examination, which considers PC based methods that can be connected to composed surveys posted via web-based networking media, in discussions, or in articles to dissect whether a journalists conclusions are certain, negative or impartial. Two ways that is essentially used to perform data mining: 1) Machine Learning (ML) and 2) Natural Language Processing (NLP). Information from a few examinations propose that both ML and NLP are connected to perform assumption investigation on various spaces, for example, those worried about instruction, electric devices, tourism [10] [11], and that's just the beginning. The writing demonstrates that POS (Part-of-discourse), N-gram calculation and pack of-words are broadly utilized NLP strategies used to assess content. Machine learning is a sort of manmade brainpower that gives a gathering of techniques and calculations which use to remove designs from information. The method implemented an approximation automated structure [12], called Filtered Wall (FW) and it filtered disposed of substance from OSN client substances. The goal is to utilize efficient classification procedure to stay away from overpowered by unsuccessful messages. In OSNs, content filtering can also be abused for a unique, more reactive

PROPOSED SYSTEM

KNIME Process: To actualize data mining in KNIME, fundamentally utilize a Text Processing expansion. The record per user hub is utilized to peruse the surveys and positive and negative extremity word references. The lexicon tagger is then used to label the positive and negative words in the surveys. In the pre-handling stage utilize number channel, accentuation eraser, stop word channel, case converter, and watchman stemmer hubs for information cleaning. At that point, it utilize a sack of words maker hub which isolates the whole archive into packs of words and checks the event of each term. The terms are changed over into string and recurrence and are figured to channel the crude and make an archive vector. Ultimately, execute choice tree to assess the precision.

Rapid Miner Process: RapidMiner Studio 7.2.002 is utilized as a part of this exploration to perform record level notion investigation of client audits on SaaS items. AYLIEN Text Analysis API effectively concentrates and investigations bits of knowledge from content. The content can be identified with news articles, social remarks, tweets or client surveys. The API is fit for performing archive level feeling investigation and also feature based or angle based slant examination. The API underpins four distinct spaces for angle based investigation, for example, autos, lodgings, carriers and eateries. For this examination, AYLIEN Text Analysis by AYLIEN 0.2.0 expansion is introduced inside RapidMiner Studio. The essential administrator, named Analyze Sentiment, is utilized to perform report level conclusion examination on client surveys. The administrator separates opinions as positive or negative from the client reviews that supply as a contribution to this administrator. The administrator requires the accompanying obligatory information parameters:

- **Connection:** An application ID and application key should be set up to validate the client.
- **Input property:** The client audit to be broke down is set in the parameter

K-NN: The k-NN calculation is one of the least difficult machine learning calculations. This calculation stores every accessible case and arranges new illustrations in view of a comparability measure; for instance, remove capacities. The calculation includes a voting instrument to decide the estimation of an obscure case. Here, k is ideally an odd positive whole number and its esteems for the most part lie in the vicinity of one and 10. In the event that k = 1, at that point a case is doled out to the class of its closest neighbor. The model can be an arrangement

or relapse display in light of the info dataset. In the test, the RapidMiner k-NN administrator is utilized to create a k-NN show. Here, k-NN is a grouping model, as our indicators data type is string. It utilize the esteem k = 5, which implies the model initially discovers five closest neighbors and afterward decides the assumption of the new illustration in light of the similitude of these five neighbors. The precision accomplished in our analysis was 95.38%

Nave Bayes: A Naive Bayes algorithm is a probabilistic classifier that uses Bayes' hypothesis. This calculation depends on freedom presumptions amongst indicators and requires a little measure of the prepared information to prepare the model. It figures the back likelihood utilizing (1).

$$P(c—x) = P(x—c) * P(c)/P(x) \quad \ldots(1)$$

where (x) is the indicator, which is client audits in our examination, on a given class (c), which is the yield variable assessment (Positive, Negative or Neutral), P(c—x) is the back likelihood of the given class indicator, P(c) is the earlier likelihood of the class, P(x—c) is the probability which is the likelihood of given class indicator, and P(x) is the earlier likelihood of the indicator. In the examination, a Naive Bayes administrator of RapidMiner is utilized to fabricate this model. The exactness accomplished in our examination was 65.48%, which is the most reduced among every single other model.

Random Tree and Random Forest: This algorithm works in the very same path as choice tree and fabricates an order show as a tree structure. The main distinction is that in the arbitrary tree calculation, just an irregular subset of traits is accessible for each part. This administrator assembles choice trees utilizing both ostensible and numerical information. All in all, the tree-related calculation is anything but difficult to decipher and can without much of a stretch foresee an objective trait in view of a few info qualities. In our examination, the essential information characteristic is client audits and the objective property is the level of supposition which is certain, negative or nonpartisan. The RapidMiner Random Tree administrator is utilized to create this model.

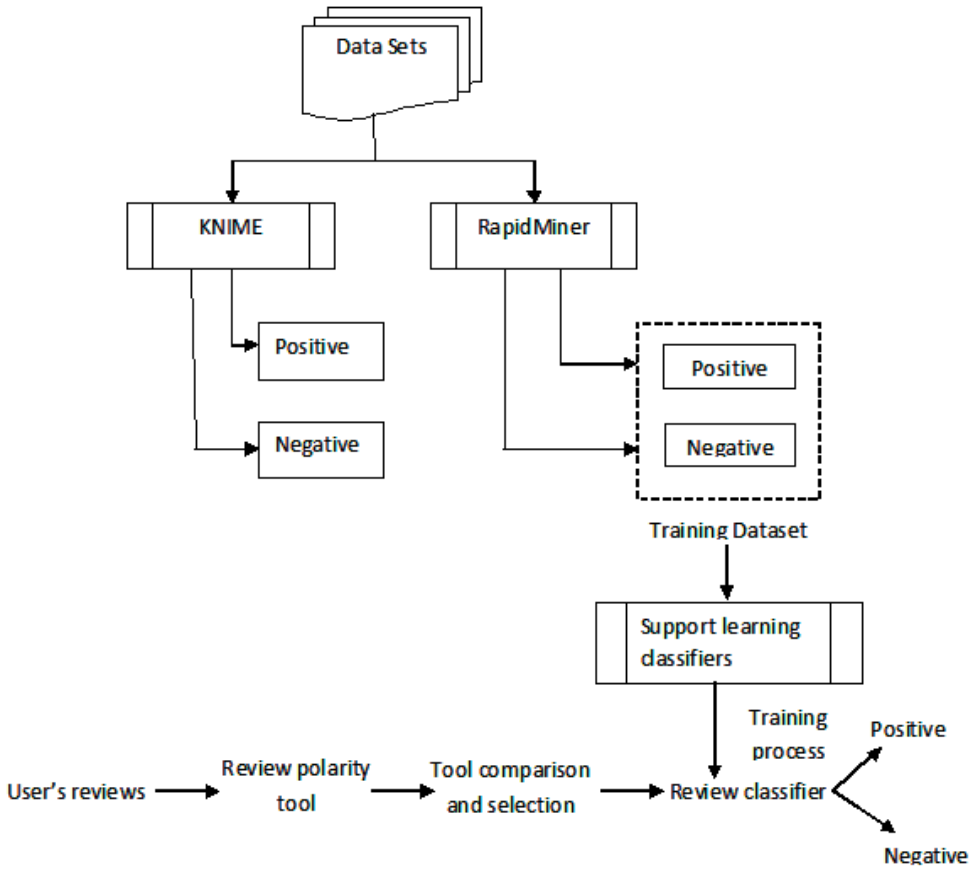

Figure 1: Experimental Low of Proposed Framework

VALIDATION

In our examination, utilize an approval administrator to first prepare and after that test the model. This is otherwise called cross-approval or x-approval administrator as it is fundamentally used to gauge the exactness of a model. This administrator is a settled administrator since it contains two sub-forms: a preparation sub-process and a testing sub-process. The main role of the preparation sub-process is to prepare the models and pass them to the testing sub-process, where the execution of the model is assessed. In the examination, the quantity of approvals of the considerable number of models was set to 10, which implies the approval administrator parceled the preparation dataset into 10 breaks even with subsets. Of these 10 subsets, nine subsets are utilized as a part of the preparation show sub-process and one subset is utilized as a part of the testing model sub-process. This procedure emphasizes 10 times on the grounds that the quantity of approvals is 10 and each of the subsets is utilized precisely once in the testing sub-process. The last outcome is the normal of the considerable number of results produced by all the testing sub-forms. The work process use for this investigation is appeared. Figure 1 describes experimental low of proposed framework

RESULT AND DISCUSSION

The proposed strategies determines the evaluation metrics namely accuracy and error rate to calculate efficiency of the proposed strategy and defeat the earlier techniques in data mining. In the method improves review extraction and sentiment categorization. The technique computes the accuracy and error rate. It executed document-level data mining utilizing the 6000 customer opinions of cloud services. To performed data mining on both the RapidMiner and KNIME platforms and contrasted the outcomes. Consequently trained and evaluated four prediction classification methods utilizing RapidMiner and could utilize trained strategies on new opinions to extract reviews in the future.

Table 1: Comparison of Accuracy and Error Rate

Learning algorithm	Accuracy (%)	Error Rate (%)
Naïve Bayes	65.48	34.52
K-NN	85.38	14.62
Random Tree	90.71	9.29
Random Forest	98.53	1.47

Table 1 demonstrates the Accuracy and Error Rate for input features with previous strategies. Table 1 shows the average value of all evaluation features with input parameters. The proposed framework is computed with following previous classifiers namely: Naïve Bayes, K-NN and Random Tree (RT) classifiers. According to Table1, it noticed that Random Forest algorithm has the best score on every specify features for classification. Table 1 noticed that the proposed method is estimated based on accuracy and error rate. Proposed RF is estimated with Naïve Bayes (NB), KNN and RT classifiers behalf of accuracy and error rate. RT is the closest competitor. It improves the categorization problem of opinions and sentiment utilizing RapidMiner and KNIME. However, RT is provided with the less accuracy and high error rate. RF method improves the opinion extraction accuracy 7.82%, and reduces Error Rate 7.82%. Lastly, the paper announces the proposed RF algorithm is best on all several features.

CONCLUSION

In the paper have executed archive level data mining utilizing around 6000 customer surveys of cloud administrations. It have performed data mining on both the KNIME and RapidMiner stages and looked at the outcomes. It prepared and looked at four expectation classifiers models utilizing RapidMiner and KNIME with the goal that could utilize those prepared models on new surveys to separate opinions later on. The method forwards the dataset which can be utilized to comprehend the enthusiastic tone of the mutual audits. Data mining is the prime concentration of this examination, which considers PC based methods that can be connected to composed surveys posted via web-based networking media, in discussions, or in articles to dissect whether a journalists conclusions are certain, negative or impartial. In rundown, the Random Forest model accomplished the most important exactness of the considerable number of models with a accuracy 98.53% and reduces 7.82% of error rate. In future work, intend to perform viewpoint based or highlight based data mining other than archive level data mining to separate particular and more exact outcomes

Ethical Clearance: Taken from Mahendra College of Engineering

Source of Funding: Self

Conflict of Interest: NA

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DOI Number: 10.5958/0976-5506.2018.00149.3

Optimization of Multiple Correlated Queries by Detecting Similar Data Source with Hive Warehouse

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ABSTRACT

Produced solitary Hive Query (HiveQL) investigating the comparative kind of task and general information from two input questions which analyze the aggregate execution time of the both inquiries. Hadoop Hive with Optimization of Multiple Query (HHOMQ) is used in the paper; another single inquiry is produced from at least two input inquiries and sample of information created utilizing DBGEN which is free database generation device. TPC-Hive inquiries are executed by information and aggregate execution time of the questions is contrasted with the execution. Hive executes single inquiry at once; various questions are given to hive by changing over them into single question. The method outcomes in lessening of task while executing the question and it additionally decrease the execution time, enhance the execution of Hive. Hive process of the organized information of data distribution center framework utilizing the method, the organized information can be process and broke down in effortlessly in convenient way. Organized information utilized for handling OLAP (Online Analytical Processing) inquiries and Hive additionally supports to process OLAP questions. Hive works in concurrence with Hadoop and it process or execute inquiry on information which is stored on Hadoop. Hadoop should be running on the framework to utilize Hive inquiry. It requires enormous measure of information for testing, for illustration, information is created utilizing gave by TPC (Transaction Performance Council), DBGEN which is free instrument for information generation. TPC give the diverse kinds of questions for testing the execution inquiry execution apparatus and examination TPC-Hive inquiries are used.

Keywords: *Hive Query (HiveQL), Hadoop Hive with Optimization of Multiple Query (HHOMQ), Hadoop, OLAP (Online Analytical Processing), TPC (Transaction Performance Council), TPC-Hive inquiries, DBGEN.*

INTRODUCTION

Nowadays, everyone is producing or gathering information from different sources in various structures like pdf, mp3, film, report records, spreadsheet document, pictures and so on and putting away it at remarkable rates. Because of this enormous measure of information, the conventional database management framework or presently accessible handling apparatuses can't process it or requires a long investment to deliver significant output. The enormous quantity of information or huge information gathered, stored, handled and analyzed utilizing different methodologies which are accessible in the market. Hadoop is open source programming depends on java programming structure and it utilizes Map-decrease algorithm for dealing of substantial informational indexes. It provides a price efficient storage resolution for expansive information volumes with no formal prerequisites and utilizations MapReduce.

The MapReduce algorithm performs two necessary steps for preparing of expansive informational collections viz. Map and Reduce. Initial step (Map), it is the vast informational index into littler parts and change over into (key, value) match. Another step, the output of initial step turned into the contribution of the progression (Reduce) and performs diminish task. Frameworks are broadly utilized for examination and information warehousing, specifically or using a high level inquiry examine such as incorporated down to a parallel dataflow chart for execution. Information warehousing is a unified store of coordinated information from different sources. The information is stored in information warehousing and recorded in nature and used to make scientific reports for the endeavor. Information warehousing utilized to process OLAP questions and batch oriented inquiry workload is moderately static. Information warehousing applications are non-intuitive in nature and it gives

opportunity to reorder then optimize inquiries to enhance overall execution.

RELATED WORK

Primarily, Hadoop was produced by Yahoo in 2006[1]. It has capacity to process enormous measure of informational gatherings in the scope of Petabyte or Zettabyte or more. It is stored on the group of item equipment (PCs), associated with each otherThe expansive informational collections, which require dispersed processing, is prepared by the Hadoop programming library system[2].

Optimization[3] in Hadoop accomplished by utilizing Hive or Pig as revelatory inquiry language and both execute OLAP activity. The difference Hive and Pig such as Pig supports organized and unstructured information and Hive can process organized information. Organized information is commonly utilized as a part of information distribution center. Pig can't be utilized in handling information distribution center since it can deal with both organized and unstructured information which is most appropriate for streaming information. Data distribution centers are not refreshed recurrently and quick reaction time in handling of questions isn't required [4]. The Big Data terms [5] ,[6] include 3 V's called Volume, Speed and Diversity. There are more V's in the idea Visualization, authenticity (consistency), inconsistency and Value. Hive [7]] is an open source SQL like interface, and it works at disseminated information distribution center framework. Hive lives over the Hadoop system and gives execution of schema based organized information inquiries [8]. Hive can't run independently, it necessitates Hadoop to be run first.

PROPOSED SYSTEM

The brief data produced the architecture of proposed Hadoop Hive with Optimization of Multiple Query (HHOMQ) appeared in Figure 1. All questions which are gone into the Hive either through Command Line Interface or Web Interface went through the layer called "Hadoop Hive with Optimization of Multiple Query". The work of the layer is to appear at input questions for comparable activity and same information source. If discovered then it produce a solitary TPC-Hive inquiries inquiry. It doesn't discover any similarity or connection in the input inquiry with other question and the TPC-Hive inquiry is annexed at the last. The produced related question is passed to next layer "compiler-enhancer executer" as input and the Metastore stores the relations, features and separations of RDBMSs.

The execution control of TPC-Hive inquiries is kept up by Driver segment. All TPC-Hive inquiries went through the proposed layer "Hadoop Hive with Optimization of Multiple Query"; the work of the layer is to verify and finish input questions for comparable kind of activity and same information source. The layer discover such connection in the input inquiries after that make another single question and if it doesn't discover any similarity after that don't make the inquiry. The layer checks all information questions one by one and continues affixing the comparative task in another single inquiry till it finds. When the proposed layer completes the activity and creates single question and then new single inquiry will experience next layer called "Driver". The Driver layer comprise of three sub parts such as Compiler, Enhancer and executer. The driver layer is do session management and the information question sent to the compiler where compiler gets metadata from MetaStore. The execution design is executed by execution strategy. Information stockroom, tables and parcels have structure data like line, segment points of interest, section composes, and connection amongst segment and features, these all data are stored in MetaStore. TPC-Hive inquiry submitted to the framework utilizing Command Line Interface or web UI or thrift interface.

Proposed framework is filtered by any comparative activity from same information source. Filtering new single inquiry is created based on the similarity of the activity from same information source. Consolidated inquiry submitted to Driver part to promote execution. Driver layer question is passing through different stage like compiler, enhancer and executer. The execution design of question and structure data is made in driver layer. The execution design is executed by execution engine. Compiler makes the legitimate execution design of the inquiry and Directed non-cyclic chart is delivered by TPC-Hive inquiry. The DAG characterizes the hive responsibility and it is executed by execution motor.

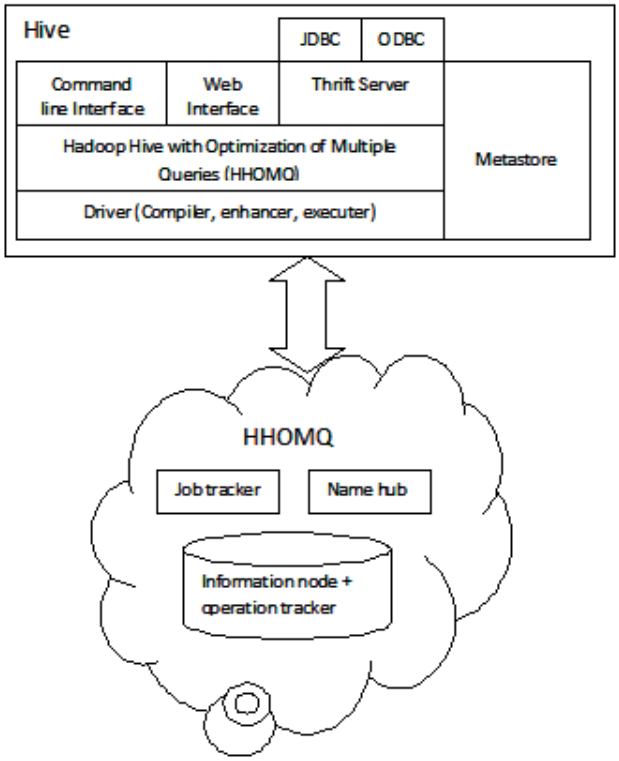

Figure 1: Architecture of Hadoop Hive with Optimization of Multiple Queries (HHOMQ)

In the framework another layer called "Hadoop Hive with Optimization of Multiple Queries (HHOMQ)" is proposed and incorporation of the layer into previous framework does not require any significant changes. The proposed framework is not difficult to utilize and coordinate.

RESULT AND DISCUSSION

The proposed algorithm is estimated on different kinds of features to prove the efficiency of methodology. The proposed algorithm is estimated with following features such as Processing queries, Data Size, Block Size and execution time.

Table 1 demonstrates the processing queries, data size, block size and execution time for respective input features with existing methodologies. Table 1 displays the average value of all respective assessment parameters with input parameters. Proposed System is computed with following existing schemes namely: MapReduce (MR), and Random Walks (RW) methodologies. According to Table1, it noticed that Hadoop Hive with Optimization of Multiple Query (HHOMQ) algorithm has the best score on every respective parameter for all data sizes.

Table 1: Comparison of Processing Queries (PQ), Data Size (DS), Block Size (BS) and Execution Time (ET)

Algorithm	Processing Queries	Data Size (GB)	Block Size (MB)	Execution Time (S)
MR	20	10	64	3150
RW	20	10	64	2860
HHOMQ	40	15	128	2430

According to Table 1 observations, the proposed method calculates processing queries, data size, block size and execution time. Proposed HHOMQ is computed with MapReduce (MR) and Random Walks (RW) methodologies behalf of calculates processing queries, data size, block size and execution time. RW is the closest competitor. It improved processing of single query with different data size. However, RW fails to process multiple queries with different data size. HHOMQ algorithm improved the execution time and processing multiple queries with different data size. Finally, the paper claims the proposed HHOMQ strategy is best on all respective features.

CONCLUSION

Execution of Hive can be improved and does not support the execution of different inquiries. It discover question from given inquiry set and have comparable information source and relationship activity, and make a solitary question based on these parameters. The questions are executed in Hive and the execution time is analyzed. Inquiry has comparative information source takes less time in execution and compare with singular inquiry. Location of connected and comparative information source questions, new layer "Hadoop Hive with Optimization of Multiple Query" presented. The activity of the layer is to check the current inquiry and produce the new inquiry based on connection and comparable information source. Proposed HHOMQ is computed with MapReduce (MR) and Random Walks (RW) methodologies behalf of calculates processing queries, data size, block size and execution time. RW is the closest competitor. It improved processing of single query with different data size. The paper states the proposed HHOMQ strategy is best on all respective features.

Ethical Clearance: Taken from Mahendra Engineering College

Source of Funding: Self

Conflict of Interest: NA

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DOI Number: 10.5958/0976-5506.2018.00150.X

Plant Identification Using Leaves with Particle Swarm Optimization and Firefly Algorithms

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ABSTRACT

This work presents a methodology to identify the type of plant using the images of leaves. The algorithms implemented for identification of a leaf are I) particle swarm optimization (PSO) and II) firefly algorithm (FF). Leaves have been collected from the internet resource, (Flavia Database).

Keywords: *particle swarm optimization; firefly algorithm; wavelet decomposition*

INTRODUCTION

Leaf identification has become an important area for a botanist, the farmers, the horticulturist and the tourists. The application of leaf identification can be further expanded to a) drug industry, b) knowing a specific place where particular types of plants or trees that can grow and c) how to improve the utilization of the leaves to the maximum extent for certain benefits. Leaf is a vegetative part of a plant. It has flat form and thin surface. The leaf is an important part of a plant. It involves in photosynthesis, the respiration. Figure 1 shows leaf parts.

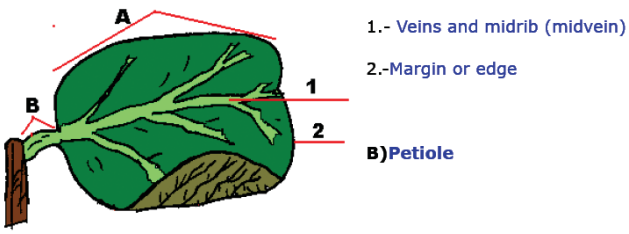

Figure 1: Part of a leaf

Types of leaves: According to the petiole, blade, edge, shape of the blade, the veins, to the arrangement along the stem. There is a great necessity to do research for identifying the leaf and associating the leaves with a particular plant. The softwares which are available commercially require the leaves to be photographed under proper lighting conditions. Softwares have to be developed so that, leaves taken at different orientations can also be identified.

REVIEW OF LITERATURE

Plant recognition has been considered (Barth´el´emy et al., 2009) [2], as recognition of leaves, flowers and other portions of a plant (Belhumeuret al., 2008) [3]. The histogramming of local features is rotation and scale invariant descriptor (Sulc and Matas, 2013) [14] which is based on local binary patterns (LBPs). Plant species can be identified using leaf recognition methods. Hence, datasets about leaves are collected (Wu et al., 2007) [15]. Environmental conditions and genotype influence the recognition of leaf species.

In practice, only broad leaves are recognized. Features like shape, color are used for leaf recognition. Bag of Words model with scale invariant feature transform (SIFT) descriptors has been used for recognition by Fiel and Sablatnig, 2007[5].

Kadir et al., 2006 [6], compared several shape methods on plant recognition using moment invariants, geometric features, Polar Fourier Transform and Zernike moments. 64% and - Polar Fourier Transform performed best achieving 64% accuracy on a database of 52 plant species. [10]Kumar et al., 2012 described Leafsnap, a computer vision system for automatic plant species identification, which has evolved from the earlier plant identification systems by Agarwal et al., 2006 [1]. Wu et al., 2007 [15], implemented a Probabilistic Neural Network for leaf recognition. Kadir et al., 2001 [7], prepared the Foliage dataset, consisting of 60 classes of leaves, each containing 120 images. [8] Kadir et al., 2012, achieved good result by

a combination of shape, vein, texture and color features processed by Principal Component Analysis before classification by a Probabilistic Neural Network.

Wu and Rehg, 2011 [15], introduced a visual descriptor for scene categorization on the Swedish dataset. Qi et al., 2012 [13], implemented texture descriptor called Pairwise Rotation Invariant Co-occurrence Local Binary Patterns with SVM for leaf classification. Novotny and Suk, 2013 [11] implemented Fourier descriptors for leaf recognition. One possible application of leaf description is the identification of a disease. Pydipati et al., 2006 [12], proposed a system for citrus disease identification using Color Co-occurrence Method (CCM), achieving accuracies of over 95% for four classes (normal leaf samples and samples with a greasy spot, melanose, and scab). Kim et al., 2011[9], classified leaves using images of bark, flowers and leaves.

MATERIALS AND METHODS

The sequence of implementing the leaf identification process is given below.

1. Read leaf image
2. Preprocess the image
3. Decompose the image using wavelet with daubauchi 'db1' . The function is dwt2('image name')
4. Apply statistical methods to calculate features from the wavelet coefficients.
5. Store the coefficients in a file called template.
6. Train the PSO and firefly algorithms using the features and store the locations of the particles.
7. In the testing process, the locations are used to identify the leave type.

WAVELET COEFFICIENT EXTRACTION

A wavelet has limited duration waveform with an average value of zero. Breaking a signal into shifted and scaled versions of the original (or mother) wavelet are called wavelet decomposition. Figure 2 shows original leaf image preprocessed and available in the database. Figure 3 presents RGB converted into an indexed image. Figure 4 presents the leaf image in size $\mathbf{2^n}$ to proper decomposition using wavelet. Figure 5 presents five level decomposition using db1. Figure 6 presents the coefficients of all the five levels for the approximation matrices.

Figure 2: Original leaf

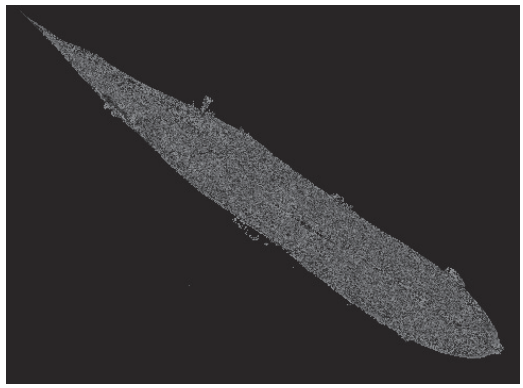

Figure 3: Indexed image

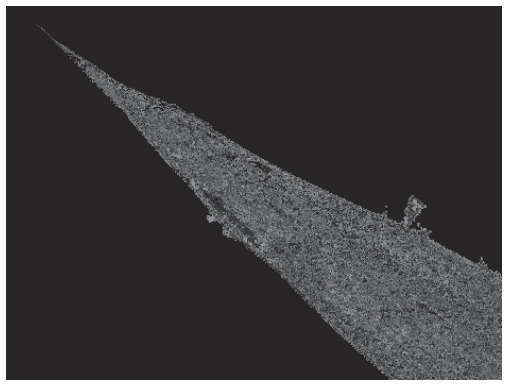

Figure 4: Resized to 2n

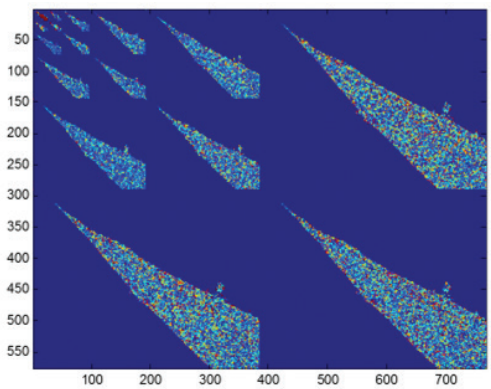

Figure 5: Fifth level decomposition

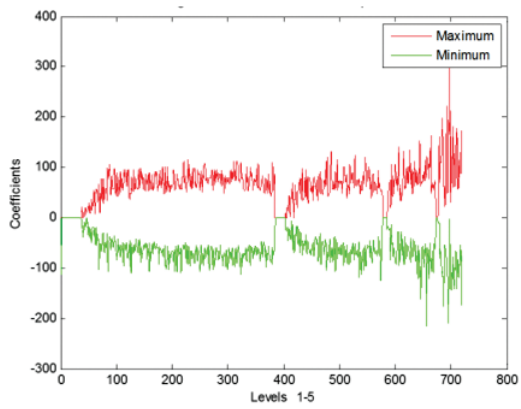

Figure 6: Wavelet coefficients of five levels of decompositions

FEATURES EXTRACTION

Approximation matrix is used for feature extraction Equations 1-5 are used for the feature extraction.

$$V1 = 1/d \sum(\text{Approximation details}) \quad \ldots(1)$$

Where,
d = Samples in a frame and
V1 = Mean value of approximation

$$V2 = 1/d \sum(\text{Approximation or details} - V1)) \quad \ldots(2)$$

Where,
V2 = Standard Deviation of approximation

$$V3 = \text{maximum (Approximation or details)} \quad \ldots(3)$$

$$V4 = \text{minimum (Approximation or details)} \quad \ldots(4)$$

$$V5 = \text{norm (Approximation or Details)}^2 \quad \ldots(5)$$

Where,
V5 = Energy value of frequency

Figure 7 presents waviness in level-1 decomposition: waviness indicates the flatness of the leaf. In Figure 8, roughness indicates the amount of smoothness present on the leaf image. Figure 9 showing roughness indicates the amount of smoothness on the leaf image. The amount of roughness and waviness help in distinguishing one leaf from another leaf. Figure 10 shows statistical parameters as mean, standard deviation, maximum, a minimum of each column.

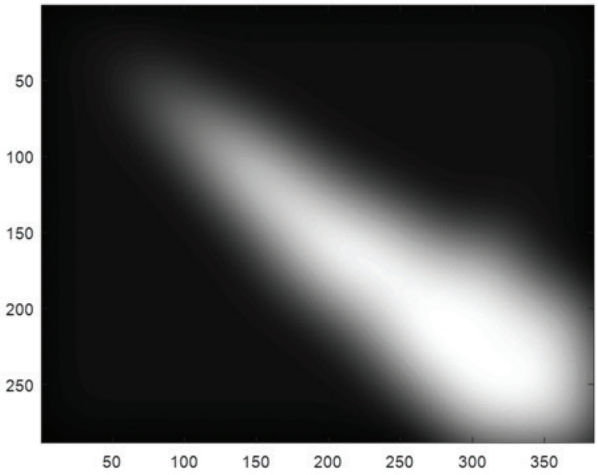

Figure 7: Waviness in the leaf image

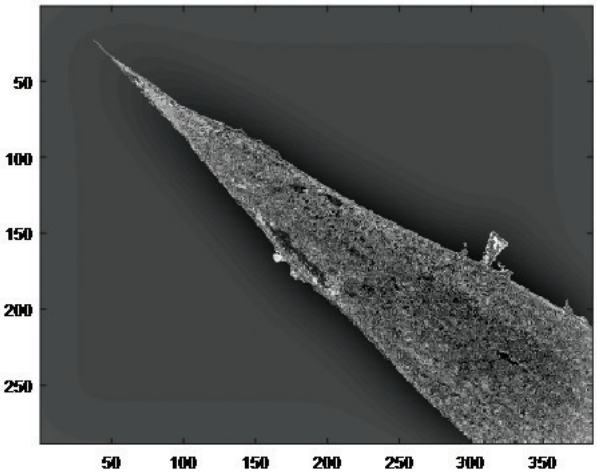

Figure 8: Roughness in the leaf image

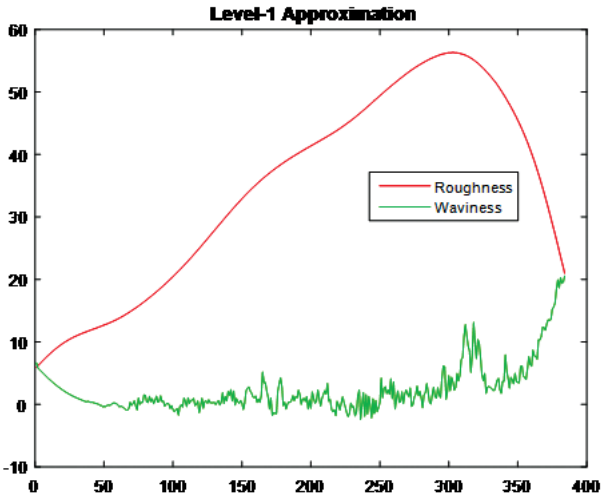

Figure 9: Roughness in level-approximation

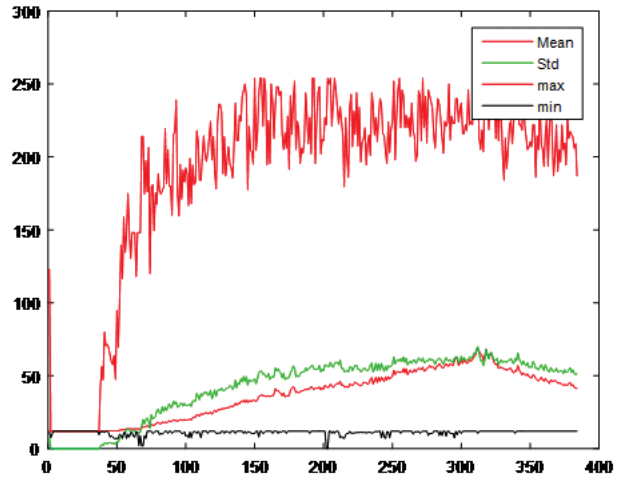

Figure 10: Statistical parameters

Particle swarm optimization (PSO): Birds searching for food is described by the particle swarm optimization algorithm [4]. They try to locate food at far away distance. A bird is called particle. Fitness values are evaluated by using fitness function to find out if the birds have reached their food. The birds move with specific velocities and directions to reach the food. The concept of generations is used for searching the location of food. Two best values are used in each generation. Present best value and global best value. After finding the two best values, the particle updates its velocity and positions with following equation (6) and (7).

velocity[] = velocity[] +Lc1*random()*(presentbest[]-present[])+Lc2*random()*(globalbest[]-present[]) …(6)

present[] = present[] + v[] …(7)

where,

velocity[] is the particle velocity

present[] is the current particle (solution).

presentbest[] and globalbest[] are defined as stated before.

random() is a random number between (0,1).

Lc1, Lc2 are learning factors. usually Lc1 = Lc2 = 2.

PSO parameter control

The number of particles: It can be anything of our choice according to the problem. It can be upto 1000 as well.

Vmax: It indicates velocity changes. Vmax can be any value split into a range from negative to positive. Example:

Learning factors: c1 and c2 usually can be any value greater than 0.

The stop condition: It is based on iterations and the minimum error specified in program execution.

FIREFLY ALGORITHM

The firefly algorithm (FA), proposed by Xin-She Yang at Cambridge University, is inspired by the behavior of fireflies.

FA uses the following three idealized rules:

- Fireflies are unisex. Each firefly can be attracted by another firefly.
- Brightness indicates the amount of attractiveness. Attractiveness is similar to Doppler effect. As the distance increases, attractiveness decreases. The less brighter will be attracted to the brighter one.
- Objective functions plays important role in the brightness of a firefly.

The attraction among fireflies is based on the brightness of the light intensity seen by adjacent fireflies. This variations is intensities is denoted by β with the distance r by equation (8).

$$\beta = \beta_o^{\gamma r^2} \quad \ldots(8)$$

where β are attractiveness and r = 0.

The movement of a firefly 'i' is attracted to another more attractive (brighter) firefly 'j' is determined by equation (9).

$$X_i^{t+1} = X_i^t + \beta_0 e^{-\gamma r_{ij}^2}\left(X_j^t - X_i^t\right) + \alpha_t \varepsilon_i^t \quad \ldots(9)$$

where

the second term indicates attraction.

the third term is randomization represents the third term.

RECEIVER OPERATING CHARACTERISTICS

Receiver Operating Characteristics (ROC) curves have long been used to evaluate classifier performance, especially in pattern recognition. Whenever pattern recognition algorithms like evolutionary methods are used for any application, ROC plays an important role in giving the performance of the algorithms. The different

points on the ROC curve indicate the performance of the algorithms for different sets of data. In this work, 31 patterns of leaf data have been obtained from Flavia dataset. One point in the ROC is obtained by testing the algorithms using 5 leaf images. To obtain the remaining nine points in the ROC, is modified nine different times. Hence, additional 9 points in the ROC is obtained. The modifications of the data are done at random.

The ROC curve provides information on the tradeoff between the hit rate (true positives) and the false alarm rates (false positives). To draw the ROC curve both positive (leaf identification) and negative (no leaf identification) examples are needed.

ROC curve is drawn using a set of positive and negative outputs.

True positive (TP): If the image contains leaf-1, and if the PSO/FF algorithms identify leaf-1 correctly, then it is truly positive.

False negative (FN): If the image contains leaf-1, and if the PSO/FF algorithms does not identify leaf-1 correctly, then it false negative.

True negative (TN): If the image contains leaf-2, and if the PSO/FF algorithms does not say it is leaf-1 correctly, then it is true negative.

False positive (FP): If the image contains leaf-1, and if the PSO/FF algorithms says it is leaf-2 correctly, then it false positive.

True positive rate (or sensitivity):

$$TPR = TP/(TP+FN) \quad \ldots(10)$$

False positive rate:

$$FPR = FP/(FP+TN) \quad \ldots(11)$$

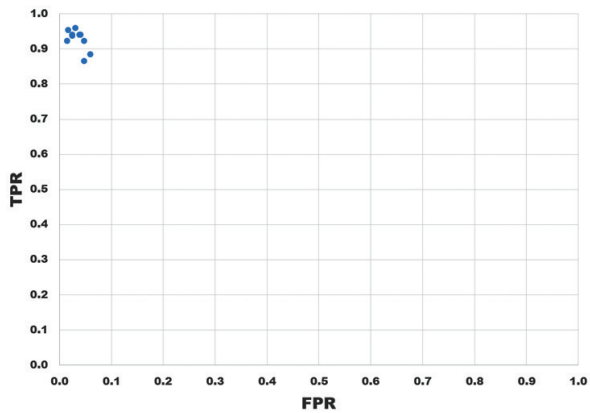

Figure 11: ROC for PSO algorithm in leaf identification

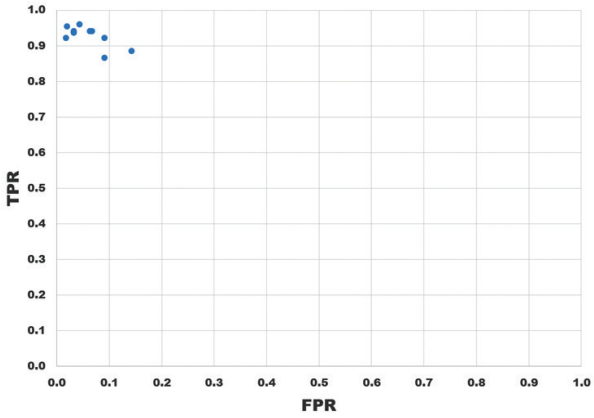

Figure 12: ROC for FF algorithm in leaf identification

Figure 11 presents ROC for the PSO algorithm. The points plotted are above diagonal which is acceptable. Hence PSO performance in leaf identification is acceptable. Figure 12 presents ROC for the FF algorithm. The points plotted are above diagonal which is acceptable. Hence FF performance in leaf identification is acceptable.

CONCLUSION

In this work, leaf identification has been done using particle swarm optimization and firefly algorithms. Both the algorithms perform equally good in leaf identification.

Ethical Clearance: Taken from Sri Sairam Engineering College

Source of Funding: Self

Conflict of Interest: NA

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DOI Number: 10.5958/0976-5506.2018.00151.1

Reliable Link and Mobile-Based Optimized Routing Scheme for Manets

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ABSTRACT

Mobile ad hoc network (MANET) contains mobile sensor nodes that dynamically form a temporary network without any infrastructure. In this paper, reliable link and mobile-based optimised routing scheme for MANETs is proposed. Semi-Markov Smooth model is implemented for enhancing the relay selection and to optimize the routing scheme in MANET. Reliability is considered as important criteria in this work. The results demonstrate that the proposed RLMOR outperformed VO-AODV under a majority of the network performance metrics and parameters.

Keywords: *Mobile ad hoc network, Semi-Markov Smooth model, reliable link and mobile.*

INTRODUCTION

In Mobile Ad hoc Networks (MANETs), erratic and visit node development may seriously degrade transmission productivity and system vigor. Hence, node versatility demonstrating assumes an imperative part in routing methodologies, particularly in link changing identification and property assessment. Very much planned portability models can reasonably mirror node practices and along these lines add to routing change.

To take care of this issue, in this letter, we propose a Reliable link and mobile-based optimized routing scheme (RLMOR) for MANETs. We right off the bat show a Semi-Markov Smooth and Complexity Restricted versatility demonstrate (SMS CR) which yields adequate smoothness and has bring down many-sided quality than SMS. Based on SMS CR, new link unwavering quality metric is additionally given stochastic properties of RLL being profoundly researched. We at long last use this metric to achieve altered MPR Selection in SMLR OLSR, which goes for longer MPR lifetime and less routing overhead.

RELATED WORK

Smooth versatility model can describe the genuine moving practices of portable clients by the physical law of a smooth motion [1]. Semi-Markov Smooth (SMS) model portrays the smooth development of versatile clients by the physical law of motion to take out sharp turns, unexpected speed change and sudden stops showed by existing models. In the first place, it is smooth and steady on the grounds that there is no speed rot issue for discretionary beginning velocity while keeping up uniform spatial node distribution paying little mind to node position. Second, it can be effortlessly and adaptably connected for recreating node portability in remote systems. It can likewise adapt to various system environments, for example, assemble portability and geographic constraints[2].

Advanced OLSR (AOLSR) protocol depends on a changed Dijkstra's calculation which empowers routing in numerous ways of thick and scanty system topologies. The routing depends on the vitality of nodes and joins and the portability of the nodes. It is a half and half ad hoc routing protocol since it consolidates the proactive and responsive highlights. It is another type of source routing protocol which permits a sender of an information parcel to incompletely or totally uncover the course the bundles take through the system. Two cost functions are acquainted with manufacture connect disjoint or node disjoint ways. Secondary functions, specifically way recuperation and circle disclosure process are associated with dealing with the topology changes of the system [3]. RTTQ (Remaining Time To Quite) utilizes separation and radio scoop to anticipate joins remaining lifetime amongst nodes and their neighboring[4].

Semi-Markov Smooth portability model mirrors the conduct of the carriers in the sky. By the versatility model, the likelihood thickness function of the relative speed of two nodes is acquired and additionally determines the expectation of the connection lifetime. The connection accessibility factor is characterized and utilizes it as the way selection metric to plan a dependable routing protocol for MANET [5]. A bunching calculation was intended for OLSR in view of the thickness and portability of nodes [6]. This calculation considers the node versatility and gives significant upgrades in regards to the quantity of chose group heads. The fundamental goal is to choose decreased and less portable bunch heads that will fill in as giving progressive routing utilizing OLSR.

Varying Overhead - Ad hoc on Demand Vector routing protocol (VO-AODV) for profoundly powerful MANET (VO-AODV) progressively adjusts the dynamic course time in light of the system topology [7]. In OLSR systems, incomplete connection state information is created and overflowed only by the Multipoint Relays (MPRs). In this manner, the nodes only get a fractional perspective of the system topology. Flooding disruption assaults may influence either the selection of the MPRs or the propagation of control movement information [8]. As a consequence, the odds of constructing various disjoint ways are lessened.

An Unobservable secure routing scheme offers complete unlinkability and content unobservability for all types of packets. This protocol is efficient as it uses a combination of group signature and ID based encryption for route discovery [9]. In Decentralized distributed Space Time Block Coding (Dis-STBC) system, the knowledge about the Channel State Information (CSI) is not available at the transmitter [10].

PROPOSED SYSTEM

Reliable link and mobile-based optimized routing scheme are presented for MANETs. RLMOR utilizes three control parcels: the route request, the route reply and the route error. At first, when a source hub is required to transmit information parcels to a particular goal, the source hub communicates a RREQ. Since the RREQs are overflowed arrange wide, a few duplicates of the exceptionally same RREQ might be gotten by a hub. Be that as it may, of all the subsequent arrangement of paths to the source, just the utilization of those duplicates, which save circle flexibility and disconnection, get the opportunity to frame the reverse paths.

The intermediate nodes get a reverse path through a RREQ duplicate; it leads a check to decide the quantity of substantial forward paths to the goal. Provided that this is true, a RREP is created by the hub, and the request is sent back to the source utilizing the reverse path. Since this route revelation, the RREP has a forward path that was not utilized in any earlier RREPs. The RREQ isn't additionally proliferated by the intermediate hub. Something else, the hub would communicate the RREQ duplicate again in the event that some other duplicate of this RREQ has not been already sent and this duplicate has prompted the refreshing or the development of a reverse path.

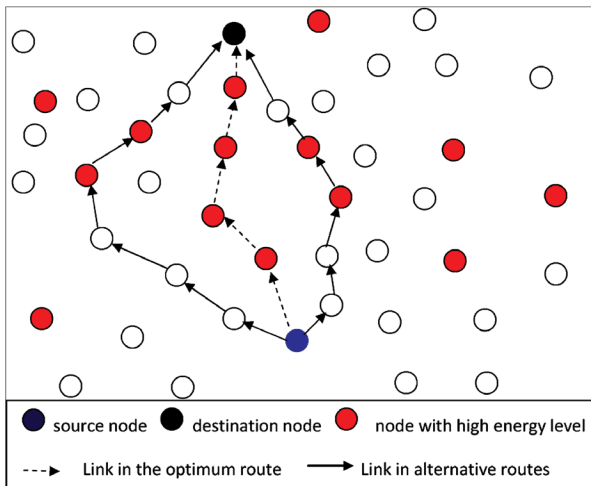

Figure 1: Optimized route selection

Figure 1 shows the optimised route selection for the proposed scheme RLMOR. The fitness function finds the important factor in the optimisation process. Delay, distance, energy etc. describes the fitness factor. The fitness function is the part of particle swarm optimization (PSO) algorithm. This algorithm is used to optimise the alternative route if there is a failure in the primary route.

RLMOR at first communicates a RREQ to accumulate data in regards to the accessible courses towards the goal where the fitness function plays out a sweep on the system to find hubs that have a more elevated amount of energy. The source point will then get a RREP that contains data on the accessible courses towards the goal alongside their energy levels. Ascertaining each course's energy level, the fitness function will then contrast with finding the course with highest energy level. The separation of this course will be considered.

SIMULATION ANALYSIS

The performance of the proposed scheme is analysed by using the Network Simulator (NS2). NS2 is a discrete event time driven simulator which is used to model the network protocols mainly. The nodes are distributed in the simulation environment.The simulation of the proposed scheme has 50 nodes deployed in the simulation area 900×900. The nodes are communicated with each other by using the communication protocol User Datagram Protocol (UDP). The traffic is handled using the traffic model CBR. The radio waves are propagated by using the propagation model two ray ground. All the nodes receive the signal from all direction by using the Omni directional antenna. The performance of the proposed scheme is evaluated by the parameters packet delivery ratio, packet loss ratio, average delay, throughput, residual energy and lifetime.

Average Delay: The average delay is defined as the time difference between the current packets received and the current packet sent. It is measured by equation (1).

$$\text{Average Delay} = \frac{1}{n}\left(\sum_0^n \text{Pkt Recvd Time} - \text{Pkt Sent Time}\right) \quad \ldots(1)$$

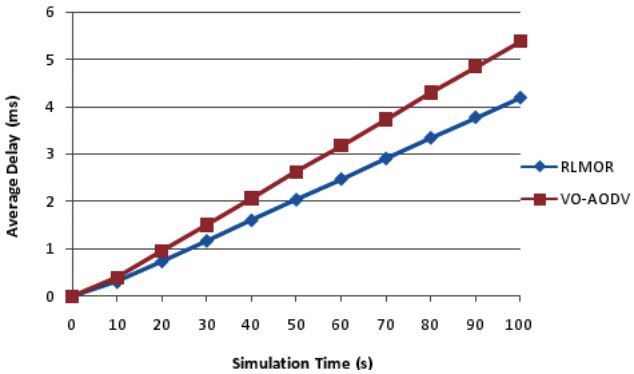

Figure 2: Average Delay

Figure 2 shows that the average delay is low by more than 23% for the proposed scheme RLMOR than the existing VO-AODV. The minimum value of delay means produces the higher value of the throughput in the network. This graph justifies the fact that the hindrances in the communication are lesser among the nodes in the network, which shows a significant average delay.

Throughput: Throughput is the average of successful messages delivered to the destination. The average throughput is estimated using equation (2).

$$\text{Throughput} = \frac{\sum_0^n \text{Pkts Received}(n)^* \text{ Pkt Size}}{1000} \quad \ldots(2)$$

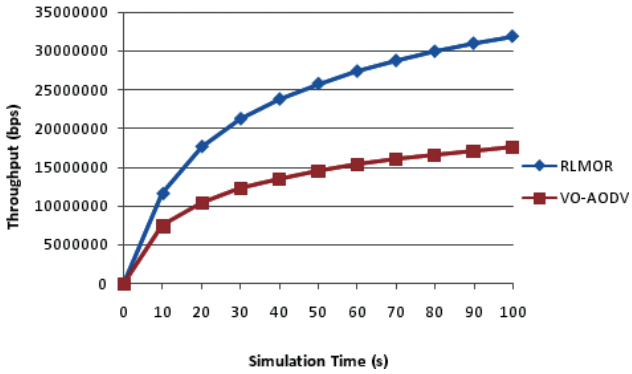

Figure 3: Throughput

Figure 3 shows that the proposed scheme RLMOR has more than 18% throughput compared to the existing scheme VO-AODV. Since there is the increase in packet delivery ratio, the throughput is automatically increased.

CONCLUSION

Reliable link and mobile-based optimized routing scheme are proposed for MANETs. Semi-Markov Smooth model is implemented for enhancing the relay selection and to optimise the routing scheme in MANET. Reliability is considered as important criteria in this work. Simulation results demonstrate that this scheme can effectively enable more realistic routing evaluation and extend the average lifetime compared to the existing scheme.

Ethical Clearance: Taken from Sri Sairam Engineering College

Source of Funding: Self

Conflict of Interest: NA

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DOI Number: 10.5958/0976-5506.2018.00152.3

Scheming Approach For Perspective Technique and Automation Using Backdrop Atmosphere Transform

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ABSTRACT

Exceptional kind of atmospheric refraction, channel can influence very high frequency band radio signals or more form transhorizon spread, assuming a vital part in correspondence and radar discovery. So it is important to contemplate the attributes and contributing components of channel. To propose Split Set Fourier Transform (SSFT) algorithm utilized to predict signature of channel, temperature reversal and exceptional humidity inclination are investigated. Based on the sounding information, signature of channel, temperature reversal and serious stickiness slope are investigated. The consequences of measurement demonstrate that temperature reversal and exceptional humidity inclination has an orientation on the event of channels while the impact of extreme humidity inclination is more momentous and direct contrasted with temperature reversal.

Keywords: *Split Set Fourier Transform (SSFT), signature of channel, temperature reversal and exceptional humidity inclination*

INTRODUCTION

In recent years, the issue of radio signals proliferation has caused across the board worry among the local and outside researchers, particularly the impacts of atmospheric channels on radar frameworks and electronic fighting. Radio framework and radar of atmospheric task are extraordinarily affected by the existence of environmental channels and it might prompt into the great horizon identification and form the radar recognition shadow region.

Techniques for radar signals propagation in the environment incorporate explanatory condition (EC) strategy, beam following technique and waveguide mode hypothesis. Beam tracing strategy can quantitatively depict the ways of the radar signal in an assortment of atmospheric conditions; however, it doesn't tackle the issue of field allocation. Waveguide mode hypothesis is convoluted in numerical calculation feature when the proliferation distance is too far or is in the sight-separate range. EC technique cannot resolve of the signal proliferation issue in the sight-distance and into the great horizon extend, additionally give great steadiness and high precision in its numerical resolution. The Split Set Fourier transform (SSFT) algorithm is proposed to investigate the signature of channel, temperature reversal and exceptional humidity inclination.

RELATED WORKS

Varieties in the list of refraction because of irregular inclination of climatic temperature and moistness in vertical regularly initiate the arrangement of atmospheric channels, which fundamentally influence the execution of radar and correspondence frameworks [1]. Issue with the past tracking algorithms is that they utilized a settled ecological model and as long as environment acts as depicted in that model these algorithms worked fine. However, the Variability of Coastal Atmospheric Refractivity (VOCAR) [2] is realized spatial and worldly channel changeability is strong elements of area, season, time and meso-scale atmospheric procedures. The climatic channels can influence multi way broadcast in maritime infrastructure [3]. Early exploratory outcomes suggest the mistakes because of refraction, specifically proliferation in environmental channels, perhaps bigger than those caused by inaccurateness characteristic of signal preparing mechanisms. The refractivity from mess (RFM) method [4] has been acquainted with acquire a constant depiction of the atmospheric channel. It found in situ from the radar ocean resounds by correlations with scope recreations and a reversal method.

In few conditions, an atmospheric channel has no impact on the messiness return, therefore it is non distinguishable in any case the reversal strategy. These conditions are specified in [5] [6] for a tri-linear surface-based channel: RFM retrievable channels are communicated thinking about their illustrative features in connection with the most extreme range of the radar signal. However, the presence of both vanishing and a surface-based channel isn't an uncommon occasion. Remote detecting technique, called refractivity from mess (RFC), has been a dynamic researching into field to quantify the climatic channel by getting sea surface replicated mess signals using dynamic radar in marine infrastructure[7][8].

PROPOSED SYSTEM

The Split Set Fourier change (SSFT) technique is a numerical strategy for resolving the signature of channel, temperature reversal and exceptional humidity inclination with high effectiveness. A period convention is accepted for the sources and fields. The SSFT strategy can be composed as

$$\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial z^2} + 2ik_0 \frac{\partial u}{\partial x} + k_0^2(n^2 - 1)u = 0$$

Where k_0 is the free space signal number and n is the list of refraction. x and z are the spatial Cartesian directions comparing to range (the heading of spread) and stature, correspondingly. As indicated by the connection between the refractive file of atmospheric channel and the changed refractive list, the altered refractive list of a surface channels. The related split set resolution is most effectively exhibited as a well ordered method. Starting with the arrangement from the earlier range set, perform the steps as Figure. 1 appears the SSF work flow diagram.

It describing proliferation over a perfectly directing surface, one can basically implement a Dirichlet or Neumann limit condition. Numerous issues in the perfectly leading surface presumption aren't adequate. The impedance limit condition is utilized to describe to the lossy idea of the surface. It has possibilities of the event in various periods of the channel, temperature reversal and intense moistness inclination. For temperature reversal, the possibility is near 70% in wintry weather and spring. It reduces to smallest amount 18% in August. For channel and exceptional humidity inclination, the varieties of the possibilities relatively understand. The possibilities are larger in late spring, summer and early harvest time while bring down in wintry weather with achieving at least 5% in January.

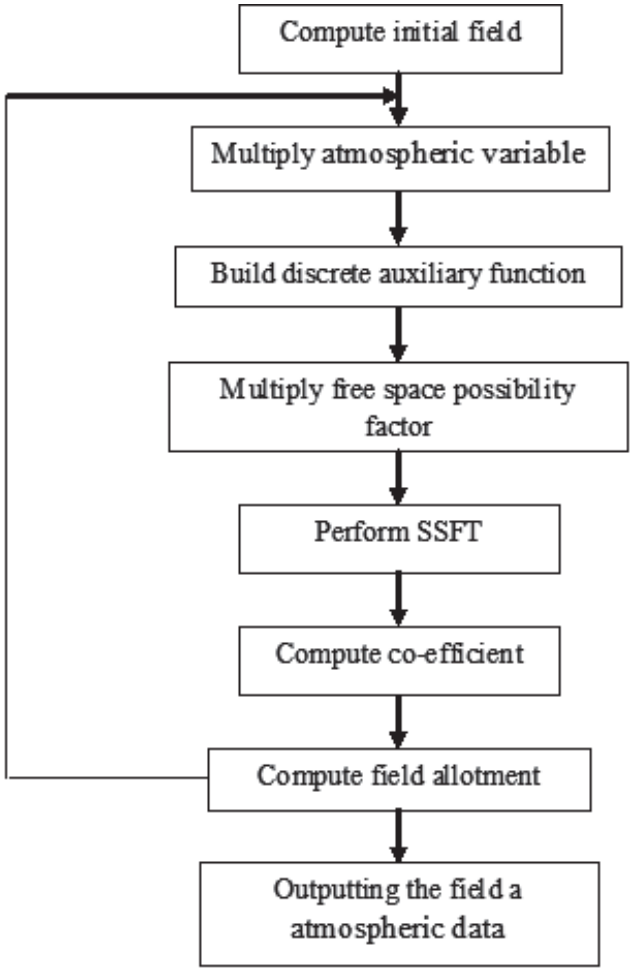

Figure 1: Workflow of SSFT

Some possibility component is the beginning stature of the channel. The possibility of the stature which measures up to 0m is 50%, and it demonstrates a large portion of the channels are surface conduit and the connection among the conduit and temperature reversal, extraordinary moistness inclination. The signatures of temperature reversal and extraordinary moistness inclination of the profiles with event of the channel are dissected. The possibility of the event of channel is an element of the temperature contrast. It specified the possibility increments as the temperature distinction increments with the exception of the reversal which between 6°C and 7°C. Possibly the probability can be in charge of that. The possibility of the event of channel is an element of the breadth of the reversal layer. The possibility of the event of channel is an element of the

reversal power (°C/100m). It can find the more grounded the temperature reversal more perhaps the channel emerges. The possibility of the event of conduit is a component of the angle of vapor thickness. It bigger the inclination is higher the possibility will be. Hence the smoother the profile of steam thickness is more probable channel happens.

RESULT AND DISCUSSION

The sounding information's are utilized to consider the channel from 0 to 3km. Possibilities of event of the channel; temperature reversal condition and exceptional humidity inclination condition are investigated. The quantity of the event of temperature reversal is significantly bigger than the channel and exceptional humidity inclination. It is reliable with the way that temperature reversal cannot generally cause exceptional humidity inclination and the channel.

The proposed SSFT methodology determines the evaluation variables such as Atmospheric Layer, Temperature Inversion condition, Exceptional Humidity Inclination and Total Outstanding Data to compute effectiveness of the proposed SSFT methodology and overcome the previous mechanisms in possibility occurrences data set. In the method improves Atmospheric Layer, Temperature Inversion condition, Exceptional Humidity Inclination and Total Outstanding Data in world.

Table 1 demonstrates the Atmospheric Layer, Temperature Inversion condition, Exceptional Humidity Inclination and Total Outstanding Data for input features with existing methodologies. Table 1 shows the average value of all estimation features with input constraints. The proposed SSFT methodology is computed with following previous methodologies such as K-means and Tropopause pressure frameworks.

Table 1: Comparison of Atmospheric Layer, Temperature Inversion, Exceptional Humidity Inclination and Total Outstanding Data

Algorithm	Data	Atmospheric Layer	Temperature Inversion	Exceptional Humidity Inclination	Total Outstanding Data
K-means	Number of occurrence	0.1960	0.61	0.495	2150
Tropopause pressure	Probability of occurrence	0.1634	0.52	0.374	2860
SSFT	Reduce the data occurrence	0.1253	0.35	0.112	3560

According to Table 1 observations, it observed the proposed SSFT methodology is evaluated based on Atmospheric Layer, Temperature Inversion, Exceptional Humidity Inclination and Total Outstanding Data. Proposed SSFT is evaluated with K-means and Tropopause Pressure frameworks behalf of Atmospheric Layer, Temperature Inversion, Exceptional Humidity Inclination and Total Outstanding Data. Tropopause Pressure framework is the closest challenger. It enhances the humidity inclination, temperature inversion and outstanding data. However, Tropopause Pressure framework does not reduce the Atmospheric Layer, Temperature Inversion, Exceptional Humidity Inclination and Total Outstanding Data. An SSFT framework enhances Atmospheric Layer 0.0381, Temperature Inversion 0.17, Exceptional Humidity Inclination 0.262 and Total Outstanding Data 700. Lastly, the paper declares the proposed SSFT framework is best on all several variables.

CONCLUSION

The sounding information's are utilized to consider the signatures of atmospheric channel and the connection amongst channel and temperature reversal, extraordinary moistness inclination phenomena. The Split Set Fourier transform (SSFT) algorithm is designed to investigate the signature of channel, temperature reversal and exceptional humidity inclination. The channel happens more probable in spring and pre-winter contrasted with wintry weather and the quantities of surface conduit and lifted channel are relatively equivalent. The possibility of the event of channel increments is the temperature distinction and the inclination of vapor thickness increments. Proposed SSFT methodology is evaluated based on Atmospheric Layer, Temperature Inversion, Exceptional Humidity Inclination and Total Outstanding Data. An SSFT framework enhances Atmospheric Layer 0.0381, Temperature Inversion 0.17, Exceptional Humidity Inclination 0.262 and Total Outstanding Data

700. Finally, the paper declares the proposed SSFT framework is best on all several variables.

Ethical Clearance: Taken from Mahendra Engineering College

Source of Funding: Self

Conflict of Interest: NA

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DOI Number: 10.5958/0976-5506.2018.00153.5

Social Networking: Following Ambiguous Consequences on Teenage Anatomy Resolving Aspects of Interruption During Sleep

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ABSTRACT

The etiology of such activities is still unidentified. Depending on models acquired from the disconnected hazardous activity (e.g., gambling, substance misuse) and neuro-psychological literary works, and conjecture that such activities are driven, to a limited extent, by hoisted engine impulsivity and poor rest quality, which is additionally a developing worry in current society; and the poor rest quality reinforces the impacts of engine impulsivity on the analyzed scope of problematical activities, in the wake of representing pressure impacts. To test utilizing Multiple Indicators, Multiple Causes (MIMIC) modeling led a period slacked consider including 384 adolescents who utilize social networking web sites. Discoveries based on basic condition demonstrating investigations uncover that the engine impulsivity drives some risky online activities, poor rest quality (at regularizing levels) does not specifically impact these activities, and poor rest quality expands the impact of engine impulsivity on swearing, relationally freak, and disadvantageous online activities, subsequent to representing pressure impacts.

Keywords: *Etiology, neuro-psychological, Multiple Indicators, Multiple Causes (MIMIC), social networking web sites (SNWS)*

INTRODUCTION

The expansion of social networking web sites (SNWS) has been to a great extent profitable for some individuals, however has prompted the development of a scope of current tricky activities. Such activities can be considered as hazardous since they can be risky (e.g., utilizing SNWS while driving), encroach social respectfulness and promote on the web and disconnected hostility (e.g., swearing on the web or utilizing a mobile phone while conversing with other individuals), or fewer beneficial for clients (e.g., utilizing SNWS as opposed to examining or working). Thus, understanding the etiology of such activities is justified and can prompt the improvement of strong intercessions.

Problematical online activities on SNWS can be established in singular contrasts related with cerebrum frameworks that administer indiscreet and problematical activities and with situational features that can impact such frameworks. To begin with, the literature on fulfilling disadvantageous and frequently saw to be degenerate activities, for example, gambling and medicate misuse proposes that characteristic impulsivity (a steady inclination to act imprudently and participate in activities without satisfactory planning) is a key driver of such activities, a feeling of perturbation in body physiology is created (e.g., through tiredness), interceptive signs are gotten by the insula and it assembles a progression of neural occasions that prompt behavioral activities worried about focusing on quick occasions that assistance right or dismiss consideration from these annoyances. The final product of this separate movement is the advancement of indiscreet activities and the capturing of decision-making procedures concerned with the managing of driving forces.

Stress controls controlled for different features and it impact problematical web activities, containing age and gender, quantity of contacts on the SNWS (which can give inspiration and chance to participate in problematical activities and grade point average (GPA) as an indirect indication of self management, intelligence and school unfortunate activity, it also correlate with problematical web activities.

RELATED WORK

Steady with the view, it has been demonstrated that lack of sleep makes annoyances that advance hasty

activities and lower restraints [1]. Poor rest quality thinks about underperformance different rest measurements containing falling and continuing unconscious, rest length and after-rest readiness, is supplying element to deprived decision making and resulting incautious and problematical activities [2]. The explanation is poor rest antagonistically impacts prefrontal cortical working [3], and it converts into powerless behavioral hindrance, and more hasty and forceful activities.

Lack of slumber makes irritations that advance indiscreet activities and lower restraints. The neural component of some irritations includes the commitment of the isolated framework and it builds the mind's dependence on the incautious cerebrum framework [4]. In reality, poor rest quality has been correlated with numerous problematical activities, containing drug utilize and backslide, and gambling, and also with forceful activities [5]. Because, poor rest is regularly connected to pressure [6], which can have comparable and perplexing impacts on problematical activities [7], one requires managing for pressure impacts before secluding rest consequences for problematical activities. The method implemented an approximation automated structure [8], called Filtered Wall (FW) and it filtered disposed of substance from OSN client substances. The goal is to utilize efficient classification procedure to stay away from overpowered by unsuccessful messages. In OSNs, content filtering can also be abused for a unique, more reactive

PROPOSED SYSTEM

Members were enlisted from a population of college understudies who utilize SNWS. In the section of the population was esteemed suitable for this investigation since it regularly has some level of rest unsettling influences and it tends to utilize SNWS, including dangerous utilize, others Exclusion criteria were: (1) more youthful than 18 years of age, or (2) not currently utilizing SNWS. All members provided composed educated assent when they began the examination.

Multiple Pointers, Multiple Causes (MPMIC) displaying, the monitored factors, sex, age and Socioeconomic status were utilized to anticipate the in secret idle factors in the general example; problematical SNWS utilize, rest quality, rest aggravation, and school fulfillment. At last, speculated a serial intercession demonstrate, hazardous social networking web sites expanded rest unsettling influence, which diminished rest quality and, decreased understudies' fulfillment with their school. Utilizing the result of coefficients method, computing the indirect impacts by duplicating the way coefficients that connection hazardous SNWS to class fulfillment through the arbiters, rest aggravations and rest quality as appeared in Figure 1.

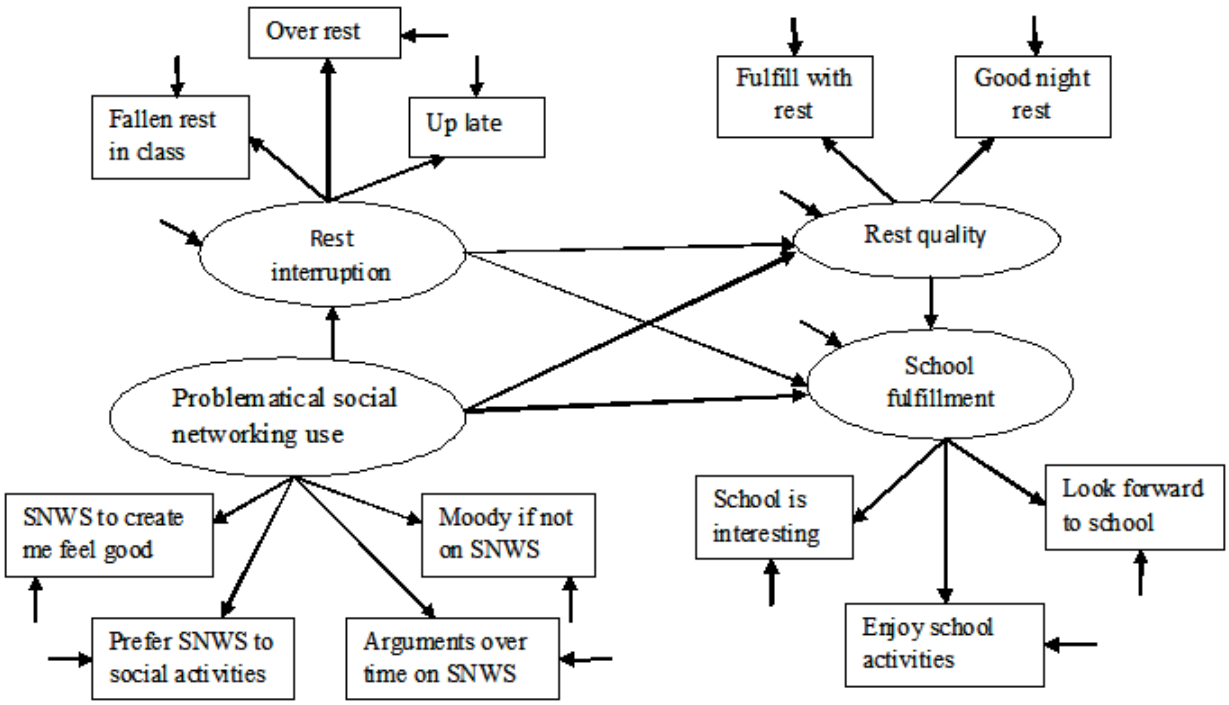

Figure 1: Workflow diagram of MPMIC model

The model incorporates an unpredictable net of associations with different result factors and dormant components, the structural condition modeling (SCM) facilities utilized it. The investigation took after the two-advance methodology, beginning with a corroborative feature analysis and arrangement of auxiliary models was evaluated. Because negative phenomena frequently don't take after the typical appropriation, predisposition revised bootstrapping (500 resample's, 95% certainty interim, and two-followed centrality) was utilized for gauge age. In the method forces no dispersion suppositions on the factors; it is valuable for surveying control impacts since the result of two factors commonly creates non-ordinary residuals. Two-followed p-values are accounted for. Basic cutoff criteria were utilized for evaluating model fit.

RESULT AND DISCUSSION

The purpose of this study was to examine the role of sleep in the association between problematic social networking use and students' satisfaction with schooling. A serial mediation model confirmed that sleep disturbances and sleep quality mediated the association. Students reporting high levels of problematic social networking use reported more sleep disturbance problems which in turn were associated with lower sleep quality, resulting in lower school satisfaction.

The MPMIC model is evaluated on dissimilar types of features to establish the effectiveness of models. The proposed MPMIC model is evaluated with following features such as Rest Quality, Depression and Accuracy. Table 1 explains the Rest Quality, Depression and Accuracy for numerous input limitations with previous models. Table 1 demonstrates the average value of all particular estimation limitations with input limitations. Proposed framework is computed with following previous models such as Confirmatory Factor Analysis (CFA) and Multidimensional Students' Life Satisfaction Scale (MSLSS) models. According to Table 1, it noticed that a Multiple Pointers, Multiple Causes (MPMIC) model has the best score on each particular limitation for all databases.

Table 1: Comparison of Rest Quality, Depression and Accuracy

Algorithm	Rest Quality (%)		Depression (%)	Accuracy (%)
	Good	Poor		
CFA	79.9	20.1	58.8	71.4
MSLSS	81	19	55.3	76.9
MPMIC	91	9	35.2	93.6

Table 1 demonstrated to measure Rest Quality, Depression and Accuracy. Proposed MPMIC model is estimated with Confirmatory Factor Analysis (CFA) and Multidimensional Students' Life Satisfaction Scale (MSLSS) models behalf of Rest Quality, Depression and Accuracy. MSLSS is the closest competitor. It is maintained managed for related covariates containing gender and age, both were mean centered. MSLSS failed to maintain a structural condition modeling (SCM). MPMIC also maintain structural condition modeling (SCM). Finally, the paper manages the proposed MPMIC model is best on all respective limitations.

CONCLUSION

Problematical web activities are a developing concern between instructors, and clinicians. The therapeutic group recognizes to require investigate into the main drivers of some activities as a way to settle them between people with extreme issues. The examination tried to inspect such models as identified with three less-contemplated, yet exceptionally normal, problematical web activities: swearing, relational aberrance and disadvantageous web utilize activities. In the method forces no dispersion suppositions on the factors; it is valuable for surveying control impacts since the result of two factors commonly creates non-ordinary residuals. Two-followed p-values are accounted for. Basic cutoff criteria were utilized for evaluating model fit. The discoveries propose that attribute impulsivity and poor rest quality can impact these activities. Proposed framework is computed with following previous models such as Confirmatory Factor Analysis (CFA) and Multidimensional Students' Life Satisfaction Scale (MSLSS) models. According to Table 1, it noticed that a Multiple Pointers, Multiple Causes (MPMIC) model has the best score on each particular limitation for all databases.

Ethical Clearance: Taken from Mahendra Engineering College

Source of Funding: Self

Conflict of Interest: NA

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DOI Number: 10.5958/0976-5506.2018.00154.7

Trust Awaken Routing for Improving The Reliable Communication in WSN

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ABSTRACT

Wireless Sensor Networks (WSN) is of ubiquitous importance in the present day wireless communication. While disseminated architecture delights a more security and fault-tolerant WSN, such architecture also places a number of security challenges particularly when employed in vital applications such as health care, environment monitoring and battlefield. In this paper, we propose Trust Awaken Routing for Improving the Reliable Communication in WSN. The main objective of this paper is to develop trust management for WSNs, and this technique is used to improve the reliability of data transmission in the network. In this scheme, the Trust Awaken Factor is used to select the reliable path from source to destination in the system. Trust Awaken Factor computed by node interaction, node recommendation, quick response and node selfishness. The simulation results show the better improvement in throughput and reduce the network delay in the network.

Keywords: *Wireless Sensor Network, Trust Routing, Reliability, Security.*

INTRODUCTION

Wireless sensor networks (WSNs) have been an area of significant research in recent years. A WSN usually consists of a large number of sensor nodes that can be quickly deployed to various terrains of interest to sense the environment. WSNs have found their wide applications in both civilian and military domains. To accomplish the targeted application and fulfill its functionalities, a WSN usually generates a large amount of data continuously over its lifetime. One of the most significant challenges then is how to store and access these sensed data. Establishing trust in a WSN environment provides numerous benefits, for example, identified the faulty node or malevolent nodes.

TAR_IRC secures the multi-hop routing in WSNs against the un trustable scenario. It identifies intruders, and it transmits the data through trustable nodes in the network. In this scheme, the Trust Manager decides the trust level of every node based on interaction among nodes, fast response, selfishness and recommendation of neighbor nodes.

RELATED WORKS

Hierarchical trust management protocol [1] identified the best trust work and formation to maximize function performance. Trust geographic routing approaches provide better packet received ratio and end to end delay without incurring substantial message overhead. The trust and reputation system [2] explains the trust model and the issue of trust in WSNs. This leads to the development of new trust models addressing the continuous data issue and also to combine the data trust and the communication trust to infer the total trust.

Trust-Aware Routing Framework (TARF)[3] provides trustworthy routing in WSNs. However, this protocol does not solve the severe problem in the network. TARF mechanism is used to select the trustable node among its neighbors and make a reliable path in the system. Protection is the important pertain for broadly distributed wireless applications owing to the wireless channels are dangerous to attacks. In [4] focused on authentication and topology control issues for improving the network throughput. The encryption and authentication protocols[5] prevent injure node data transmission while the selected relay is attacked, their cost is high. A game theoretic approach [6] offers a security defense decisions without centralized administration. In security defense mechanisms, have treasured system considers the security necessity and the system resources. Multimodal

biometrics with intrusion detection systems [7] used to facilitate the defects of unimodal biometric systems. It decides whether user authentication is expected and which biosensors should be chosen, depending on the security posture. Secure and Energy Aware Routing Protocol [8] planned for improving energy efficiency and security in WSNs. In this scheme, the source selects the route based on utility theory. Trust-aware location-based routing protocol [9] that defends the routing attacks. This protocol efficiently detects malevolent nodes and enhances the network lifetime.

Trust Awaken Routing for Improving the Reliable Communication in WSN: In this scheme, we describe the trust model that is used to invent the trust between two nodes in the network. This trust factor is used to decide corresponding node is a reliable or not. This trust factor is computed by node interaction, quick response, node selfishness and recommendation of other nodes.

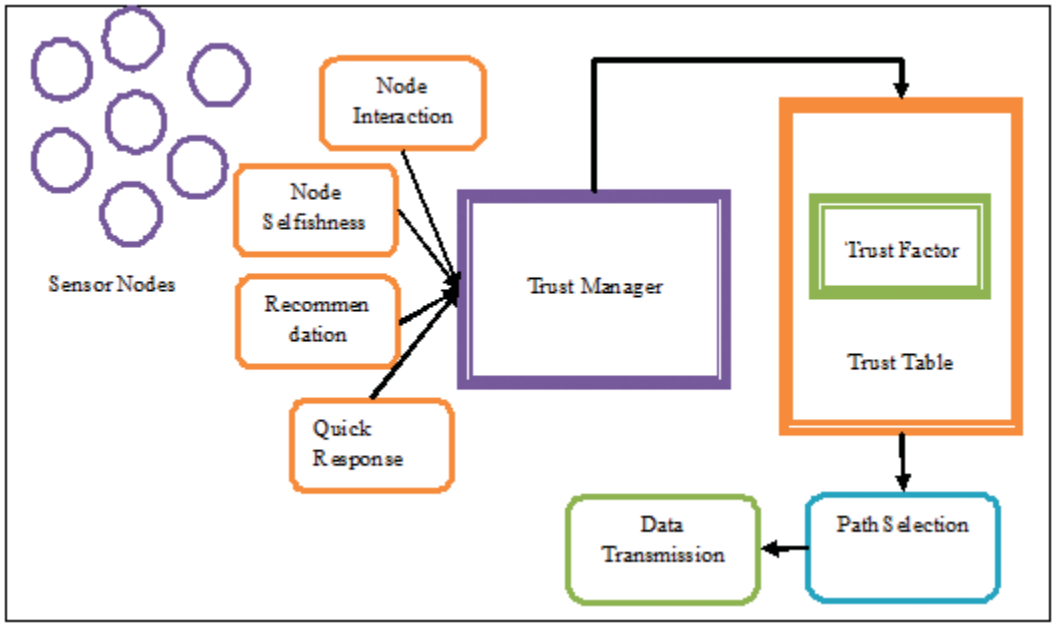

Figure 1: Architecture of TAR_IRC Scheme

Architecture of TAR_IRC Scheme is shown in Figure 1. Here, the trust manager checks the every node performance such as the node interaction, node selfishness, node recommendation and quick response. Here, the node interaction represents the interaction between neighbor node and selfishness indicates the node does not utilize the resources like energy or other resources.

Quick response refers the timing difference between send Route Request (RREQ) and receives Route Reply (RREP). The Trust Manager evaluates the RREQ reaches the time of source to corresponding node and RREP time of the corresponding node to source node. The trust manager estimates the Node recommendation value by neighbor recommendation of the corresponding node in a network. The trust manager updates these four parameter value in a table. While data transmission, the source check the value and decide which path is a data transmission path. Finally, the source transmits the data via selected path; hence destination received the data from the reliable way in the network.

Performance Evaluation: The performance of TAR_IRC scheme is analyzed by using NS2. Here, 30 nodes deployed in the simulation area 500×500. The performance of TAR_IRC scheme is evaluated by the parameters throughput and delay in the network.

Throughput: Throughput refers to the total number of packets successfully delivered across the network for every 1000 packets sent. Figure 2demonstrates that TAR_IRC is higher throughput compared to that of the TARF mechanism.

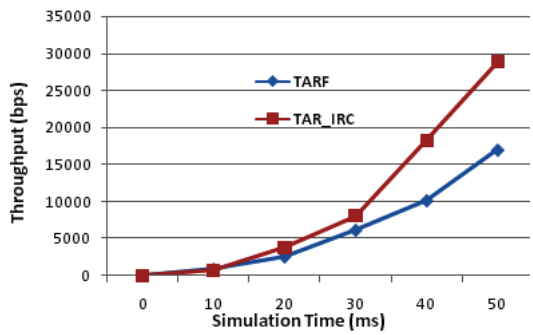

Figure 2: Throughput of TARF and TAR_IRC

Average Delay: The average delay is defined as the time difference between the current packets received and previous packets received. Figure 3 indicates that the TAR_IRC has the lower delay for a node when compared to the TARF scheme.

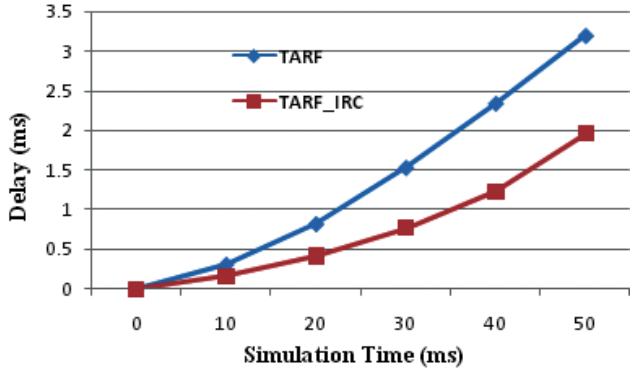

Figure 3: Delay of TARF and TAR_IRC

CONCLUSION

In this work, we explained Trust Awaken Routing for Improving the Reliable Communication in WSN. The TAR_IRC can improve system efficiency while reducing the effect of malicious nodes. The trust evaluating approach can efficiently detect and prevent unreliable, selfish, and faulty nodes in the network. The simulation results demonstrate that TAR_IRC improves the throughput and reduces the network delay in the network.

Ethical Clearance: Taken from Sri Sairam Engineering College

Source of Funding: Self

Conflict of Interest: NA

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DOI Number: 10.5958/0976-5506.2018.00155.9

A Pragmatic Evaluation of Learning Integrated Enterprise Resource Planning (ERP) in Global Perspectives

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ABSTRACT

With the use of smart gadgets and technology based products, almost every domain is using I.T. based products so that higher degree of performance and efficiency in the work can be achieved. The segment of Education and Learning is also one of the key areas where enormous products are in use including Learning Management Systems, E-Learning Suites, Smart Education based ERP Applications and many others. The global community of education including universities, colleges, schools and institutes are working on high performance ERP based education tools for real time access of teaching and learning resources. The global market of e-learning in year 2014 was 165.36 million dollars which is predicted to be escalated to 243.8 million dollars with the Compound Annual Growth Rate (CAGR) of more than 5% as the reports from Statista, the Statistical Portal. This research manuscript focuses on the market size as well as the usage patterns of E-Learning ERP applications in the academic domain with the specific case scenario of Moodle LMS as one of the prominent and multi-functional platforms for the development of Learning ERP.

Keywords: *E-Learning ERP, Education ERP, Learning Management System, Moodle LMS.*

INTRODUCTION

Learning Integrated Enterprise Resource Planning (ERP) [1] platforms assist the academic community including students, research scholars, professors, laboratory instructors, library staff and related professionals in the escalation of their knowledge with the aides of teaching and learning resources in real time. Now days, the trend of integrating Learning ERPs are increasing in the universities, schools and research institutes so that the students as well as professors can access the historical and current resources for higher degree of effectiveness.

The scenario of adopting ERP products in education is also in the upward line in India as per the reports from Google and KPMG [2]. In a research analytics performed by KPMG with the association of Google, it was presented that the Online Education Industry will be around two billion dollars in India by the year 2021. In addition, the reports present that the patters of online search increased two times for education and three times from smartphones for education and learning purposes. The access and consumption of YouTube content on education also intensified four times in India. This data is very fascinating in terms of the growth of Indian region in using the cloud based products on education and learning. The growth in the market size of e-learning is escalating rapidly with the forecast of more than 243 billion dollars by year 2022. This statistics and prediction is presented by Statista [3] and presented in Figure 1.

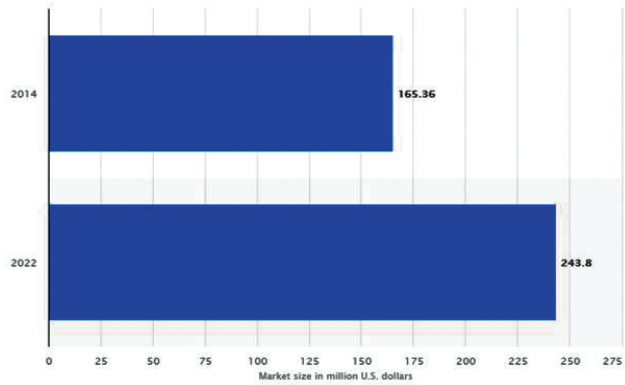

Figure 1: Global Market Size of E-Learning Products in Billion Dollars

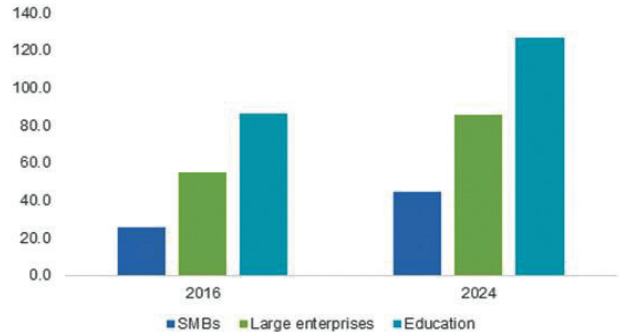

Figure 2: Predictive Pattern of Global E-Learning Market Size in Billion Dollars

From another research survey, it is found that more than 63% students feel contented and satisfied with the integration of digital learning products in their academic activities for the escalation of knowledge and quality of the teaching and learning activities. Figure 2 expressed the predictive pattern of global market statics data behalf of E-Learning.

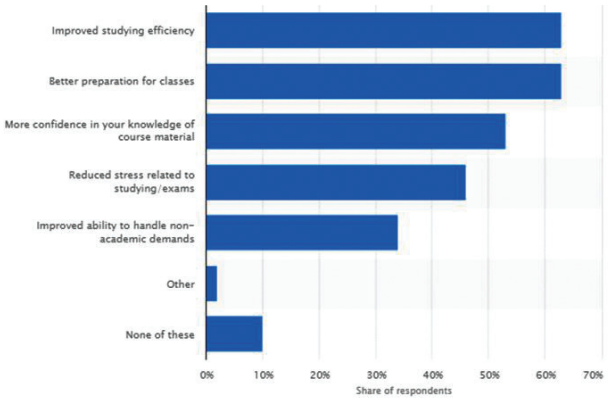

Figure 3: Feedback from the users of E-Learning Framework

RELATED LITERATURE

Several researchers and practitioners have worked on the analysis of similar domain with the suggestive remarks but there is huge scope for the improvement in cases where the deep evaluation of the tools, technologies and paradigms are required to be done. Here, Figure 3 explained the feedback of E-learning users. Enormous multi-sources based manuscripts, research papers and articles are analyzed from the time span up to year 2017 so that the latest trends in learning ERPs can be evaluated.

Abdulrahman Alharthi et al. (2017) [4] underline the exploratory study with the investigation of cloud based learning products for higher education in Saudi Arabia. The work projected the use of an effectual framework so that the successful and performance aware learning environment can be built.

Mohammad A. A. Alhawamdeh (2017) [5] devised and implemented the Fuzzy Decision Support Systems (FDSS) for the selection of appropriate technology based learning solutions. The author presents the integration of artificial intelligence with the decision trees for effectiveness in the decision-making process.

Suvarna L. Kattimani et al. (2017) [6] projected the use of cloud based technology products in the education for real time delivery of teaching and learning resources to the end user with higher degree of accuracy and performance. The implementation scenario of automatic timetable generation is presented in this work with the related advantages.

Brenda M. Scholtz et al. (2017) [7] developed an effectual mobile based solution for m-learning with the experimental study and analytics of the user experiences. The study underlines the benefits and relative advantages of using simulation based learning activities for higher performance.

Hassan Alhanatleh et al. (2016) [8] evaluated the attitude of employees from Jordanian Education Ministry with the integration of cloud ERP. The work presents the evaluation with the base analysis of technology acceptance model (TAM). The results indicated that the employees of Queen Rania Center (QRC) were in favor of the cloud ERP based implementation. Florian Schwade et al. (2016) [9] analyzed the challenges and scope of ERP based skill development for the students of German spoken universities. The authors presented the unique model and process for the development of software applications for higher efficiency and performance in the teaching and learning activities.

Shangeerthana G V et al. (2016) [10] expressed the key factors for reconsideration in implementing scenarios of E-Learning in the corporate segment of India so that the learning strategies and overall outcome can be improved. Ali Tarhini et al. (2016) [11] developed a performance aware conceptual model with the evaluation using Technology Acceptance Model (TAM). The work presents a framework which was tested on assorted parameters and found effectual in the teaching and learning activities.

Brown (2004) [12] defined research paradigm is the design and handling of the study by the investigator in developing the study results. Research is trans-disciplinary in nature. Research paradigm is the standard procedure by the investigator and it follows the scientific method of action in acquiring the results. Research always direct towards the finding answers for the problem framed and develops the theory and principles. Research paradigm is the first attempt by the investigator and the person chooses the method of handling the complete study from the two main categories as positivism and Interpretive. Huberman & Miles (2002) [13] elaborated that the research approach is the way in which the study is taken. Approach is the choosing of the method in which the data collection is handled. The research approach is of two types. They are quantitative and qualitative approaches. The quantitative approach will be in terms of numbers and the qualitative approach will in the textual manner. Qualitative approach will be biased

Maxwell (2004) [14] said that a research design is the group of progressed decisions that makes up the main plan articulating the methods and actions for assorting and evaluating the needed data. Research drawing is a rational structure that gives the coherent structure that directs the researcher to speak to the research issues and respond to the research questions. Research design is the main component in any research methodology. Research design is widely divided into two types. They are exploratory and conclusive research designs. The conclusive research design is sub divided into descriptive and causal research designs.

RESEARCH DESIGN AND METHODOLOGY

Research Objectives

The broad objectives of the present study are as follows:

- To evaluate the performance of learning ERPs in the academic institutes on assorted factors and parameters.
- To analyze the role of learning management systems in the escalation of learning and teaching process in the academe.
- To analyze the contentment level of the students and professors in the academic institutes
- To investigate the relationship between the adoption of learning ERP applications and the overall performance of the students as well as mentors

Research paradigm: The study followed the mixed paradigm. The study followed the positivism and the interpretivism technique. The study needs to reveal the answer by means of the numerical and the content manner. Positivism will be the purposive study and the interpretivism is the other type that will make use of open-ended questionnaire to depict the views and opinions of the respondents in clear manner. The study employs the positivism method since it deals with the information of the performance with the contentment level obtained from the academe segment. The study aims at revealing the functions and features in the learning ERPs with the relative performance factors

Research Approach: The study followed a mixed approach. The study aims at collecting the information from the students of academic sector by means of open-ended questionnaires and the secondary data source is gathered from the statistical portals. The study also collects the information regarding the performance of students with the satisfaction score using quality based SERVQUAL model

Research design: The study followed the methods of descriptive data. The study links both the qualitative and the quantitative approaches. The descriptive method of design will assist both the approaches and hence, the study includes the principles of the descriptive design. The descriptive study tries to explain systematically a condition, difficulty, occurrence, service or program, offers data regarding the living circumstances of a group, or explains attitudes towards a subject. Table 1 explains the work flow of proposed research methodology goals. Where, Table 2 discussed about the analysis of the key parameters and factors in details.

Relationship of Parameters in Research

Table 1: Research Objectives and Design

RESEARCH OBJECTIVES ▼
● To evaluate the performance of learning ERPs in the academic institutes on assorted factors and parameters.
● To analyze the role of learning management systems in the escalation of learning and teaching process in the academe.
● To analyze the contentment level of the students and professors in the academic institutes
● To investigate the relationship between the adoption of learning ERP applications and the overall performance of the students as well as mentors

Contd…

STATEMENT OF RESEARCH PROBLEM

▼

An Empirical Evaluation of the Learning ERPs with the Contentment and Performance Analytics in the Academic Sector

RESEARCH DESIGN

▼

Primary Data Collection

- Questionnaires
- Contact Mode
- Focused Personal Interviews

Secondary Data Collection

- Government Publications
- Whitepapers
- Research Libraries
- Progress Reports
- International Journals
- Books
- Periodicals
- Magazines
- Newspapers

METHODOLOGY

▼

- Random Sampling
- Hypothesis Testing
- Trends Analysis

MULTIDIMENSIONAL APPROACH TO EXAMINE PROBLEM

▼

- Statistical Analysis IBM SPSS
- Data Analytics
- Graphical Reports Generation
- Data Interpretation

Table 2: Analysis of the Key Parameters and Factors

LITERATURE REVIEW FROM NATIONAL AND INTERNATIONAL PUBLICATIONS	
FACTORS AFFECTING THE PERFORMANCE	**FACTORS AFFECTING THE RESEARCH PROBLEM AND OUTCOMES**
The key factors for the customer satisfaction are: ● Adaptability of the Learning ERPs ● Timely Submission of the Assignments and Tasks ● Multidimensional Scoring and Performance of the students **SAMPLING TARGETS: DELHI NCR** ● Delhi ● Dehradun ● Shimla ● Chandigarh ● Ghaziabad **QUESTIONNAIRE STRUCTURE** ● Questions Related to the Basic Information ● Feedback and Queries ● SERVQUAL Based Queries ■ Tangibility ■ Reliability ■ Empathy ■ Assurance ■ Responsiveness ● Professional Aspects Based Questions ● Behavioral Aspects Based Questions	● Subject ● Type of Institute ● Scores ● Task Approval Status ● Overall Grading ● Responsiveness ● Communication Time ● Problem Anticipation ● Open Ended ● Overall feedback **DEPENDENT VARIABLES** **Customer Satisfaction** ● Amenable Behavior ● Approval Time ● Overall Grading ● Responsiveness ● Communication Time ● Problem Anticipation ● Overall feedback **Independent Variables** ● Service Quality ● Customer Loyalty ● Security

Sampling Methodology

Sampling design: The study includes convenience sampling technique to conduct the interviews with the students and professionals of the academe in North India. For studying the customer satisfaction level and scoring, the sampling unit is taken as selected regions of North India.

Results, Analytics and Interpretation: For data interpretation, the sample size of 100 users of e-learning are evaluated so that the overall perception towards learning ERPs can be evaluated from the respondents from the regions of New Delhi, Dehradun, Shimla, Chandigarh and Ghaziabad. The key focus on the data evaluation is related to the association of learning ERP and the learning pattern with the satisfaction of the respondents. Figure 4 display the architecture of design analytic pattern.

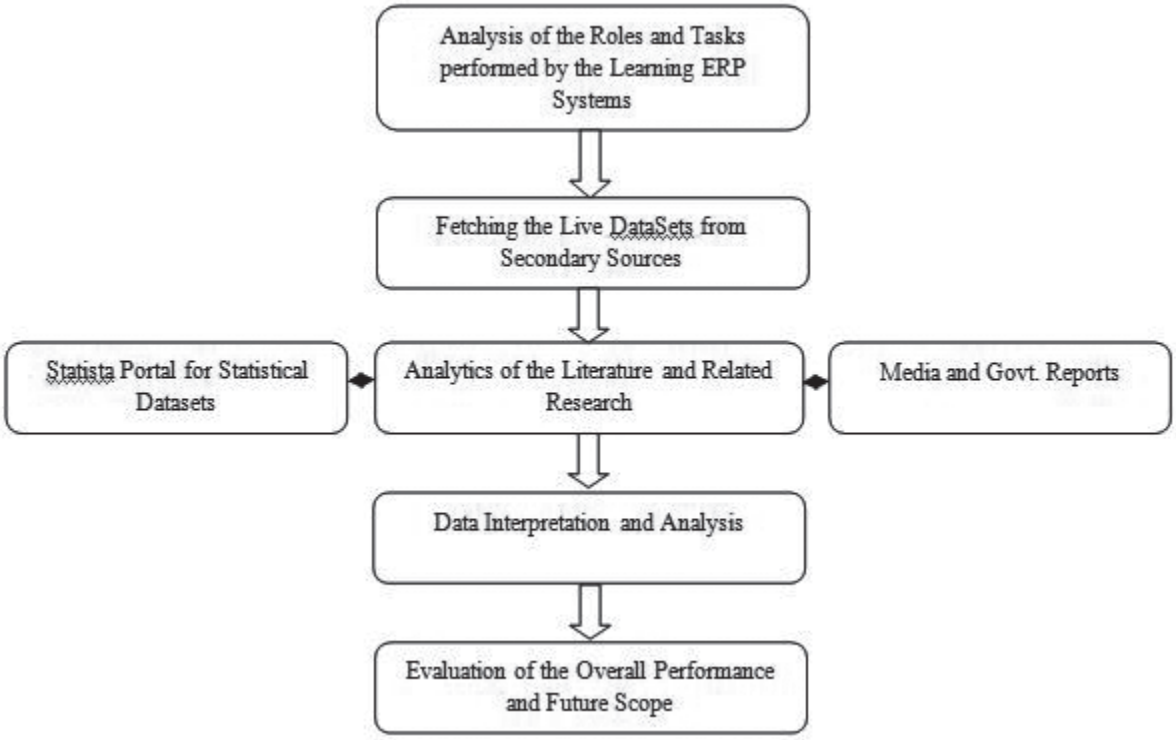

Figure 4: Analytics Pattern

Table 3: Impact of Learning ERP on Swift Academic Resources

Opinion/Response	New Delhi	Dehradun	Shimla	Chandigarh	Ghaziabad
Highly Satisfied	20	22	20	21	22
Satisfied	5	6	5	4	3
Cumulative Responses	25	28	25	25	25

The respondents were contented with the performance of technology products for the teaching and learning activities. From the data, it is found that around 90% users are exceedingly happy with the general execution and integration of the e-learning ERPs in their institutes. Table 3 displays the ERP learning impact of Swift Academic Resources and Table 4 of Learning ERPs on Accomplishment on Assignments Timely.

Table 4: Impact of Learning ERPs on Accomplishment on Assignments Timely

Opinion/Response	New Delhi	Dehradun	Shimla	Chandigarh	Ghaziabad
Highly Satisfied	24	22	22	24	20
Satisfied	1	6	3	1	5
Cumulative Responses	25	28	25	25	25

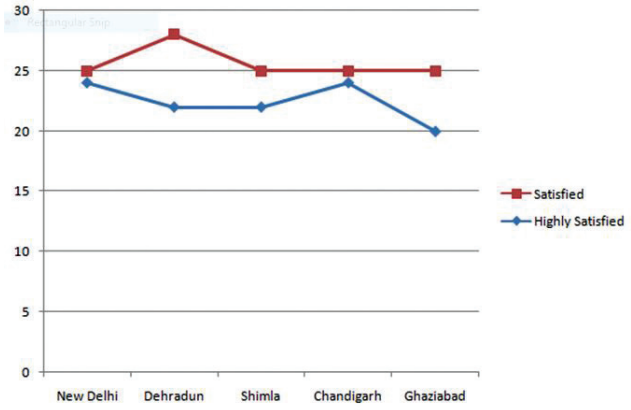

Figure 5: Perception on Timely Work

The Table and Graph represents the fantastic and remarkable response from the users in terms of timely submission of their academic assignments with the real time support from their mentors. Figure 5 explained the perception on timely work of various cities.

Over 80% customers are exceedingly contented with the implementation of learning ERP systems in their institutes.

1. 0 SPSS evaluation cells (.0%) are having the count in expected dimensions less than 5. The minimum expected count is 19.72

2. Computed only for a 2 × 2 table

The Pearson's Chi^2 value if 5.491, p=0.1 and the results illustrates that there is a strong impact of responsiveness that is adopted and exercised at the institutes. Because of this fact, it can be deduced that the institutes are adopting and following the technology acceptance model for quality and delivery the higher degree of service to the users of academic sector so that the work can be done in minimum overheads and lesser complexities. Table 5 display the Chi-Square Tests with subject interest level

Table 5: Chi-Square Tests

	Value	df	Asymp. Sig. (2-Sided)	Exact Sig. (2-Sided)	Exact Sig. (1-Sided)
Pearson Chi-Square	5.492[a]	1	.010		
Continuity Correction[b]	4.637	1	.20		
Likelihood Ratio	5.318	1	.02		
Fisher's Exact Test				0.29	.009
Linear-by-Linear Association	5.550	1	.011		
N of Valid Cases	128				

1. 0 SPSS evaluation cells (.0%) are having the count in expected dimensions less than 5. The minimum expected count is 18.87

2. Computed only for a 2 x 2 table

RESULTS

The Pearson's Chi^2 test generates the result of 5.492, p=0.1 and the outcomes delineates that there is solid effect of assurance and understanding that is embraced and practiced with the adoption of learning ERP. On account of this reality, it can be reasoned that the higher level of administration and understanding to the students is delivered in least overheads and lesser complexities. Case Processing Summary with respect Adoption of performance Modules in ERP and its with their performance evaluation are given in Table 6.

Table 6: Case Processing Summary with respect Adoption of performance Modules in ERP and its Performance Analysis

	Cases						
	Valid		Missing		Total		Impact
	N	Percent	N	Percent	N	Percent	
Reliability	128	100.0%	0	.0%	128	100.0%	Strong
Assurance	128	100.0%	0	.0%	128	100.0%	Strong
Tangibility	128	100.0%	0	.0%	128	100.0%	Strong
Empathy	128	100.0%	0	.0%	128	100.0%	Strong
Responsiveness	128	100.0%	0	.0%	128	100.0%	Strong

RESULTS

Case Processing Summary is important to evaluate and analyze the missing values and related aspects of the database. Table 7 expresses the final outcome of ERP case processing behalf of E-learning adoptions.

The results show that the dataset is valid without any missing or invalid record.

Table 7: Final Outcome and Decisive Factors towards the Acceptability and Ease with Adoption of Learning ERP CASE PROCESSING SUMMARY

	Cases						
	Valid		Missing		Total		Impact
	N	Percent	N	Percent	N	Percent	
Amenability and Swiftness	128	100.0%	0	.0%	128	100.0%	Strong
Overall Grading and Feedback towards services	128	100.0%	0	.0%	128	100.0%	Strong
Intime approval	128	100.0%	0	.0%	128	100.0%	Strong
Functioning	128	100.0%	0	.0%	128	100.0%	Strong
Overall Score	128	100.0%	0	.0%	128	100.0%	Strong

RESULTS

The result of case summary is shown that there is strong relationship and no missing values in the dataset. Where, Table 8 display the descriptive statistics and Table 9 and Chi-Square Test with dataset performance evaluations details.

NPar Tests

Table 8: Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
Experience	128	1.2000	.40684	1.00	2.00

Chi-Square Test

Table 9: Test Statistics

	Experience
Chi-Square	10.800[a]
Df	1
Asymp. Sig.	.001
a. 0 cells (0.0%) are having thee frequencies in expected dimensions less than 5. The minimum expected cell frequency is 15.0.	

RESULTS

As with the Degree of Freedom 1, the value of Asymp. Sig. is less than the Rejection Threshold 0.005, it is found that the there is strong relationship and association between adoption of technology products and relative performance of the users.

To analyze the results of the null as well as alternate hypothesis, the following statistical analysis using SPSS software has been performed. Table 10 explains Homogeneity of Variances with respective data. ANOVA result is explained in Table 11.

Table 10: Test of Homogeneity of Variances
Feedback 360 Degree

Levene Statistic	df1	df2	Sig.
216.000	1	18	.000

Table 11: ANOVA Result
Feedback360Degree

	Sum of Square	Df	F	Sig.
Between Groups	0.800	1	6.000	.025
Within Groups	2.400	18		
Total	3.200	19		

CONCLUSION

The teaching and learning activities can be escalated to higher degree of accuracy and scheduling with minimum delay in the institutes. This research work is having key focus on the implementation of learning ERPs in the academic institutes with the data analytics from selected regions of North India and found the contented feedback from the respondents.

Ethical Clearance: Tata Consultancy Services, Bangalore

Source of Funding: Self

Conflict of Interest: Nil

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DOI Number: 10.5958/0976-5506.2018.00156.0

A Study on Capital Structure Pattern of JSW Steel Industry

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ABSTRACT

In this paper, an attempt has been made to study the "Capital Structure Pattern of JSW STEEL Industry". An analysis of long-term solvency, assessment of debt-equity, debt to total fund and justification for the use of debt in JSW STEEL Industry through the application of ratio analysis and statistical test has been undertaken. The time period considered for evaluating the study is five years i.e. from 2013 to 2017. It is found that long term funds had contributed more on an average 72.59 percent of total funds when compared to short term funds (27.40 percent) in JSW STEEL Industry. Long term funds had apportioned nearly two-third of total funds. Shareholders' funds had occupied on an average 34.57 percent of the total funds when compared to the borrowed funds (38.01 percent).

The JSW STEEL Industry had shown an inclination in strengthening long term funds consisting of both shareholders funds as well as long term borrowed funds in order to finance its assets requirement. JSW STEEL Industry mostly depended on equity financing. So, the financial risk of the company is low, but it could fail to enjoy the advantages of financial gearing. JSW STEEL Industry should raise the debt funds to bring the optimum capital structure for improving the financial performance of the company. A higher interest coverage ratio is desirable, but too high ratio is some of the years of the study indicate that the JSW STEEL Industry is very conservative in using debt, and it is not using debt to the best advantage of the shareholders.

Keywords: *Debt-equity ratio, Debt to total fund ratio, Interest coverage ratio and structure of total funds JSW STEEL industry.*

INTRODUCTION

One of the most critical areas of the finance function is to make decisions about the firm's capital structure. Capital is required to finance investments in plant and machinery, inventory, accounts receivable and so on. Capital structure is the part of financial structure, which represents long term sources. It is the permanent financing of the company represented primarily by shareholders' funds and long term debt and excluding all short-term credit. To quote Walker [10], "The term capital structure is generally defined to include only long term debt and total stockholders' investment". It refers to the capitalisation of long term sources of funds such as debentures, preference share capital, long term debt and equity share capital including reserves and surplus (retained earnings).

REVIEW OF LITERATURE

According to Bogen[1], "The capital structure may consist of a single class of stock, or it may be complicated by several issues of bonds and preferred stock, the characteristics of which may vary considerably". According to Childs[2], "Capital Structure includes all long term obligations and equity that is only items of permanent capital". The term capital structure is used to represent the proportionate relationship between debt and equity.

Harry Gouthmann and Herbert E. Dougall[3] stated that the phrase capital structure, may be used to cover any long term debts like mortgages and long-term loans as well as total stockholders' investment including retained earnings as well as original investment. According to Khan and Jain[4] The selection of the capital structure will obviously depend on the bearing that is has on the firm's objective of maximisation of shareholders' wealth. According to Pandey[5] Capital structure decision is a significant managerial decision. The market value of the share may be affected by the capital structure decision.

The analysis of data is carried out through capital structure ratios such as debt-equity ratio by Paul [6], debt

to total fund ratio and interest coverage ratio. Statistical tools like mean, standard deviation, coefficient of variation and coefficient of correlation are also applied. In other words of Philips [7], "Capital structure refers to the composition of capitalisation i.e., to the proportion between debt and equity that make up capitalisation". The vital ratio is to determine the efficiency of the financial management of business undertakings by Roy Choudhary[8]. Sharma and Gupta [9] mentioned that the Estimation of requirement of capital is necessary, but the formation of capital structure is most important.

MATERIALS AND METHOD

The data drawn from the annual reports of JSW STEEL Industry have been carefully analysed, tabulated and interpreted by using well established financial tools. The analysis of data is carried out through capital structure ratios such as debt-equity ratio by Paul [6], debt to total fund ratio and interest coverage ratio. Statistical tools like mean, standard deviation, coefficient of variation and coefficient of correlation are also applied. Graphs and diagrams are presented to illuminate the facts and figures.

Research Objectives: The present research paper aims at endeavouring the following objectives:

- To analyse the capital structure Pattern;
- To assess of long-term solvency; and
- To ascertain the justification for the use of debt.

Scope and Coverage: The present study is confined to JSW STEEL Industry. This study is restricted to assess the pattern of capital structure in JSW STEEL Industry with the help of the ratio analysis. The time period considered for evaluating the study is five years i.e. from 2013 to 2017. Table 1 expresses the quantum and structure of total funds in JSW steel industry.

Table 1: The quantum and structure of total funds in JSW steel industry

Particulars	Mar' 17 12 months	%	Mar'16 12 months	%	Mar'15 12 months	%	Mar ' 14 12 months	%	Mar' 13 12 months	%	Average	%
Share capital	837.95	1.07	1,067.19	1.54	1,067.19	1.49	1,067.19	1.61	563.18	1.11	4602.7	1.37
Reserves	23,796.77	30.30	20,685.77	29.82	24,657.41	34.42	23,216.99	35.17	19,374.19	38.04	111731.1	33.20
Share holder's funds-I	24,634.72	31.37	21,752.96	31.36	25,724.60	35.91	24,284.18	36.79	19,937.37	39.14	116333.8	34.57
Secured loans	27,821.20	35.42	25,871.16	37.30	25,496.89	35.59	21,054.32	31.89	15,434.26	30.30	115677.8	34.38
Unsecured loans	4,875.37	6.21	2,069.90	2.98	264.34	0.37	3,920.66	5.94	1,109.53	2.17	12239.8	3.64
Borrowed fund- II	32,696.57	41.63	27,941.06	40.28	25,761.23	35.96	24,974.98	37.83	16,543.79	32.48	127917.6	38.01
Long term funds (I+II)	57,331.29	73.00	49,694.02	71.65	51,485.83	71.87	49,259.16	74.62	36,481.16	71.62	244251.5	72.59
Payables	12,608.76	16.05	10,997.66	15.86	12,515.39	17.47	9,991.25	15.13	9,274.36	18.21	55387.42	16.46
Current liabilities	8,463.48	10.78	8,414.42	12.13	7,278.11	10.16	6,415.97	9.72	4,873.98	9.57	35445.96	10.53
Provisions	132.13	0.17	251.78	0.36	353.6	0.49	343.72	0.52	302.05	0.59	1383.28	0.41
Short term funds	21,204.37	26.99	19,663.86	28.35	20,147.10	28.12	16,750.94	25.38	14,450.39	28.37	92216.66	27.40
TOTAL FUNDS (A+B)	78,535.66	100	69,357.88	100	71,632.93	100	66,010.10	100	50,931.55	100	336468.1	100

Source: Compiled from Annual Reports of JSW STEEL industry

Note: Figures in parentheses represent common size percentages considering total funds for the respective years equal to hundred.

RESULTS AND DISCUSSION

It is evident from Table 1 that long term funds had contributed more on an average 72.59 percent of total funds when compared to short term funds (27.40 percent) during the entire period of the study. Long term funds were more than the short term funds in JSW STEEL industry. In other words, long term funds had apportioned nearly two third of total funds. The borrowed funds had reported a rise while short term funds depicted inverse direction in quantitative terms. Shareholders'funds had jumped from ₹ 19,937.37 crores in 2013 to ₹ 24,634.72 crores in 2017. Reserves and surplus had almost doubled in the concluding year of the study. Shareholders' funds had occupied on an average 34.57 percent of the total funds when compared to the borrowed funds (38.01 percent). In other words, borrowed funds were less as against the shareholders' funds during the entire period of the study. It may be concluded that JSW STEEL industry had used more owned funds when compared to borrowed funds. It may be also observed that short term funds are more relatively than borrowed funds in JSW STEEL industry. The JSW STEEL industry had shown an inclination in strengthening long term funds consisting of both shareholders funds as well as long term borrowed funds in order to finance its assets requirement.

Assessment of Long-Term Solvency: Leverage ratios indicate the extent to which the firm has used its long-term solvency by borrowing funds. The short-term creditors, like bankers and suppliers of raw material, are more concerned with the firm's current debt-paying ability. As a general rule, there should be an appropriate mix of debt and owner's equity in financing the firm's assets. The leverage or capital structure ratio include for the purpose of analysis:

- Debt-equity ratio
- Debt to total fund ratio
- Interest coverage ratio

Debt-Equity Ratio: The ratio may be calculated in terms of the relative proportion of long term debt i.e. borrowed funds and shareholders' equity i.e. net worth. This is a vital ratio to determine the efficiency of the financial management of business undertakings by Roy Choudhary[8]. The generally accepted standard norm of debt-equity ratio is 2:1. Debt - equity ratio is calculated by using the following formula**:**

Debt–Equity Ratio = Long Term Debt/Net Worth

Table 2: The Debt-Equity Ratio of JSW Steel Industry

Year	Long Term Debt (Rs. In Crores)	Net Worth (Rs. In Crores)	Ratio (In Times)
2017	32696.57	24634.72	0.000447
2016	27941.06	21752.96	0.000506
2015	25761.23	25724.6	0.000428
2014	24974.98	24284.18	0.000453
2013	16543.79	19937.37	0.000552
Mean	25583.53	23266.77	0.000473
Standard Deviation	5258.74	2113	0.005206
C.V (%)	0.205552	0.090816	11.01125
Co- efficient of correlation between debt and equity (r) =0.6493			

Source: Compiled from Annual Reports of JSW STEEL industry

Table 2 shows debt-equity ratio of JSW STEEL industry. The debt-equity ratio is calculated by dividing the long term debt with net worth. It is evident that long term debt of the company had increased remarkably from ₹ 16543.79 crores in 2013 to ₹ 32696.57 crores in 2017. Net worth had gradually moved from ₹ 19937.37crores to ₹ 24634.72 crores over the study period. Debt-equity ratio had varied from the lowest of 0.000552 times in

2013 to the lowest of 0.000447 times in 2017. The ratio is well below than the standard ratio of 2:1. It means that the debt employed by the company was low from the point of view as the standard ratio. However, the interest of the debt- holders of the company was well protected. The mean, standard deviation and co-efficient of variation (C.V) of debt-equity ratio in JSW STEEL industry are 0.000473 times, 0.005206 times and 11.01125 percent respectively.

The coefficient of correlation between debt and equity in JSW STEEL industry was 0.6493 and thereby indicating that there was highly negative relation between debt and equity. It may be concluded that the JSW STEEL industry could still mobilize the debt funds in order to reap the benefits of financial leverage. It increases the earning per share of company.

Debt to Total Fund Ratio: It may, therefore, compute debt to total fund ratio by dividing total debt by total fund. Total debt will include short-term funds plus long-term debt i.e. borrowed funds. Total fund will include total debt plus net worth. A high ratio means that claims of creditors are greater than those of owners. A high level of debt introduces inflexibility in the firm's operations due to the increasing interference and pressures from creditors. Debt to total fund ratio is calculated by using the following formula:

Debt to Total Fund Ratio = Total Debt/Total Fund.

Table 3: Debt to Total Fund Ratio of JSW Steel Industries

Year	Total Debt (Rs.in Crores)	Total Fund (Rs. In crores)	Ratio (In times)
2017	53900.94	78535.66	0.686324
2016	47604.92	69357.88	0.686366
2015	45908.33	71632.93	0.640883
2014	41725.92	66010.1	0.632114
2013	30994.18	50931.55	0.608546
Mean	44026.86	67293.62	0.65425
Standard Deviation	7602.43	9152.47	0.830642
C.V (%)	0.172677	0.136008	1.26961
Co-efficient of correlation between debt and equity(r) = 0.9852			

Source: Compiled from Annual Reports of JSW STEEL Industry

Table 3 provides the debt to total fund ratio. The financial variables considered for the competition of debt to total fund ratio include total debt and total fund. It is obvious that total debt and total fund had reported an increasing trend. Total debt had jumped from ₹ 30994.18crores in 2013 to ₹ 53900.94 crores in 2017. The total debt had exceeded over the total fund during the entire period of the study. The ratio is less than the unity. The mean, standard deviation and co-efficient of variation (C.V) of debt to total fund ratio in JSW STEEL industry are 0.65425 times, 0.830642 times and 1.26961 percent respectively.

The debt to total fund of JSW STEEL industry had a positive relationship as the coefficient of correlation is very high i.e., 0.9852 that means almost all one. It may be concluded that the financial risk of the company is low. But the company could fail to enjoy the advantages of financial gearing.

Interest Coverage Ratio: The interest coverage ratio shows the number of times the interest charges are covered by funds that are ordinarily available for their payment. The lender will be interested in finding out whether the business would earn sufficient profits to pay the interest charges and interest being paid periodically. The interest on debt, being a prior charge on profits affects profitability of a concern. The capital structure of a firm, therefore, affects its profitability. In order to accomplish this objective, the interest coverage ratio of the JSW STEEL industry is computed. The higher the coverage, the better will be the position of debenture holders or loan creditors regarding their fixed payment of interest, the greater will be the profitability. The

universal standard of Interest Coverage Ratio is around 7 to 8 times.

The ratio indicates the extent to which the earnings may fall without causing any embarrassment to the firm regarding the payment of fixed interest charges. Interest coverage ratio is calculated by using the following formula: Interest Coverage Ratio = EBIT/Interest.

Table 4: The Interest Coverage Ratio of JSW Steel Industry

YEAR	RATIO
2017	2.36
2016	0.92
2015	1.74
2014	1.99
2013	2.2
Mean	1.84
Standard Deviation	0.51
C.V (%)	0.28

Source: Compiled from Annual Reports of JSW STEEL industry.

It is found from Table 4 that the ratio is used to determine how easily a company can pay interest on outstanding debt. Interest coverage ratio is calculated by dividing the earnings before interest and taxes with interest charges. It is clear those earnings before interest and taxes and interest charges as shown an increasing trend over the study period. The mean, standard deviation and co-efficient of variation (C.V) of interest coverage ratio in JSW STEEL industry are 1.84 times, 0.51 times and 0.28 percent respectively. It may be observed that the behaviour of the ratio was so erratic indicating ups and downs over the period under the reference.

It is evident that the interest charges are fully covered by the earnings before interest and taxes. A higher ratio is desirable, but too high ratio is some of the years of the study indicate that the JSW STEEL industry is very conservative in using debt, and that it is not using debt to the best advantage of the shareholders. From the point of view of the creditors safety, the larger the coverage, greater the ability of the firm to handle fixed charges and more assured the payment of interest. In contrast, a low ratio is a danger signal indicating that firm uses excessive thereby a firm is indicating inability to honour the assured payment of interest to the creditors.

CONCLUSION

The JSW STEEL industry had shown an inclination in strengthening long term funds consisting of both shareholders funds as well as long term borrowed funds in order to finance its assets requirement. JSW STEEL industry mostly depended on equity financing. So, the financial risk of the company is low. But the company could fail to enjoy the advantages of financial gearing. Rising of funds through debt is relatively cheaper than equity in terms of cost of issue and interest cost. The company could still mobilize the debt funds. It means that the company could raise the external funds to bring the optimum capital structure i.e. minimise the cost of capital and maximise the share value of the firm. It is due to the tax deductibility of the interest paid on debt.

So, these benefits of financial leverage shall be reaped for improving the financial performance of the company. The behaviour of the interest coverage ratio was so erratic. The interest charges are fully covered by the earnings before interest and taxes. A higher interest coverage ratio is desirable, but too high ratio is some of the years of the study indicate that the JSW STEEL industry is very conservative in using debt, and it is not using debt to the best advantage of the shareholders. Hence, it is suggested that JSW STEEL industry shall tap the debt funds optimally to maintain the balanced capital structure.

Ethical Clearance: Cauvery College for Women, Tiruchirappalli

Source of Funding: Self

Conflict of Interest: Nil

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DOI Number: 10.5958/0976-5506.2018.00157.2

Impact of Unorganized Sector in Indian Economy

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ABSTRACT

Agriculture is the backbone of Indian economy and it accounts for almost 14% of India's gross domestic product (GDP). Agriculture is an important sector, which determines growth and sustainability and plays a vital role in the development of India, with over 60 percent of the country's population deriving their subsistence from it. Most of the rural population in India depends on agricultural practices for employment and livelihood. Indian economy in agriculture has shown a steady growth in the last two decades. The economy is also experiencing regular changes in its demographics, lifestyle, and domestic consumption. The agriculture industry in India is growing at a great pace and is expected to grow many folds in the near future.

After globalization almost every country in Asia welcome foreign direct investments in many sectors and it is growing its limits steadily. Being an agrarian developing country India is not an exception, like all other countries India also allowed FDI in various sectors including agriculture. FDIs have been playing an important role in promoting economic growth, triggering technological transfer and creating employment opportunities. Increased economic growth reduces poverty and raises the living standards.

Keywords: *Agriculture, Economy, manufacturing, enterprises, kirana store*

FDI POLICY IN INDIA

In simple words FDI refers to capital inflows from abroad that are invested in or to enhance the production capacity of the economy. Foreign Investment in India is governed by the FDI policy announced by the Government of India[1].

The main governing bodies that define the future role of agriculture in India are the Ministry of Agriculture, the Ministry of Rural Infrastructure and the Planning Commission of India. It aims at developing agricultural sector of India. The latest developments in FDI in Indian agriculture sector are as follows FDI up to 100% is permitted under the automatic route in activities such as development of seeds, animal husbandry, pisci-culture, cultivation of vegetables and mushrooms etc under controlled conditions and services related to agro and allied sectors [2].

FACTORS INFLUENCING THE PRODUCTIVITY OF INFORMAL SECTOR ENTERPRISES IN INDIA

- The informal sector in India is dominated by own-account manufacturing enterprises (OAMEs) employing family labor. Income growth in the organized sector creates consumer demand increase for several informal sector products. Relevant goods and services include transport, retail services, eateries, processed food, and garments and so on. Rapid growth has led to an explosion in the number of rickshaws in our smaller towns; the same is true of street vendors, road-side eateries, domestic help and so on. In most cases entry require the permission of local mafia or political bosses and hence new entrants have to part with some income [3].
- Like consumption goods, there is also increase in the demand for informal goods and services to be used as input into formal production. Agricultural

goods in general, processed food, fruits, flowers, forest products, handicrafts and a variety of ethnic and cultural items are used as inputs in formal sector [4]. But because of the relatively low value added the effect on informal income, and particularly wage income, is not significant. Similarly, services like security, local transport, hosting and event management, cleaning and laundry, cooking etc are bought by the organized sector as inputs [6]. But these services are mostly provided by informal enterprises that employ contract workers with low wages. Now a customer can travel miles to reach a particular shop, if he or she sees value in shopping from a particular location[5].

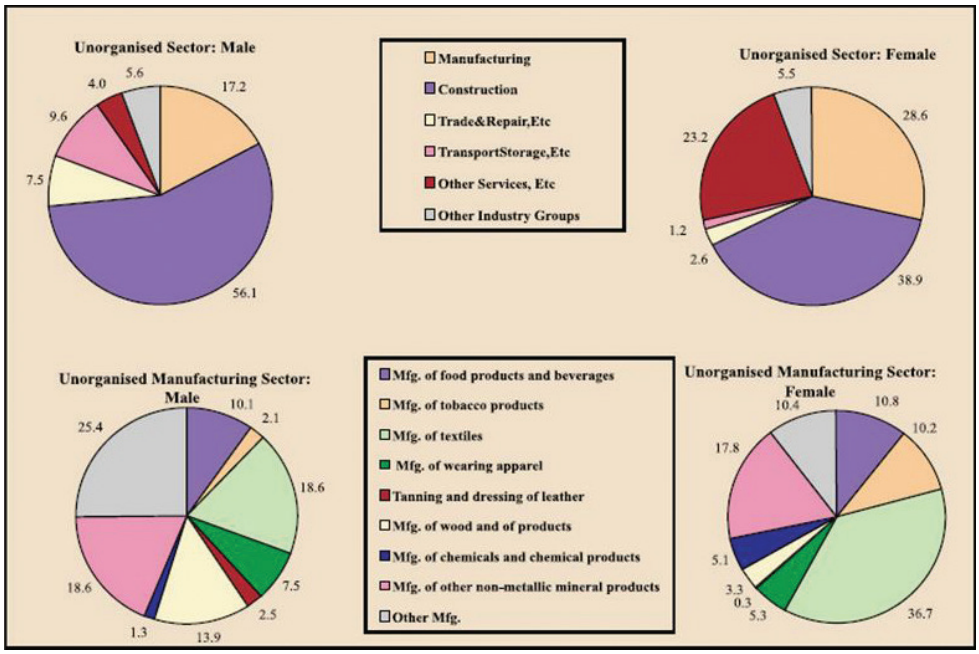

Figure 1: Percentage employment in Formal and Informal Sector

A range of informal enterprises link more directly with the formal sector. They are small units working for profit [7]. They produce items like auto parts, electronic goods, metal products, and engineering goods and provide services like repairs, assembly, printing, copying, and publishing etc. The study comes across two types of relations here. In one they supply the products which are then processed by the formal sector. Figure 1 expresses the employment ratio of Formal and Informal Sector**.** In the other, they produce as sub-contractors for formal sector firms. In all cases, the transmission of income is hampered by the abysmally low wages prevailing in the informal sector, which results from low labor productivity [8].

THE REASONS FOR UNORGANIZED RETAIL SECTOR DOMINATION IN INDIA

- In smaller towns and urban areas, there are many families who are traditionally using these *kirana* shops/'mom and pop' stores offering a wide range of merchandise mix. Generally these kirana shops are the family business of these small retailers which they are running for more than one generation.
- These kiran shops are having their own efficient management system and with this they are efficiently fulfilling the needs of the customer. This is one of the good reasons why the customer doesn't want to change their old loyal kirana shop.
- A large number of working class in India is working as daily wage basis, at the end of the day when they get their wage, they come to this small retail shop to purchase wheat flour, rice etc for their supper. For them this the only place to have those food items because purchase quantity is so small that no big retail store would entertain this.
- Similarly there is another consumer class who are the seasonal worker. During their unemployment period they use to purchase from this kirana store in credit and when they get their salary they clear their dues. Now this type of credit facility is not available in corporate retail store, so this kirana stores are the only place for them to fulfill their needs.

- Another reason might be the proximity of the store. It is the convenience store for the customer. In every corner the street an unorganized retail shop can be found that is hardly a walking distance from the customer's house. Many times customers prefer to shop from the nearby kirana shop rather than to drive a long distance organized retail stores.
- These unorganized stores are having n number of options to cut their costs. They incur little to no real-estate costs because they generally operate from their residences. Their labour cost is also low because the family members work in the store. Also they use cheap child labour at very low rates.

OPPORTUNITIES AND CHALLENGES OF UNORGANIZED SECTOR IN INDIA

Opportunities:

- India's booming economy is a major source of opportunity. It is the third largest in the world in terms of purchasing power. India is the second fastest growing major economy in the world.
- India's huge population has a per capita income of Rs 44,345.
- The proportionate increase in spending with earnings is another source of opportunity**.**
- With the Indian economy now expected to grow at over 8% and with average salary hikes of about 15%, manufacturers and retailers of consumer goods and services can expect a major boost in consumption.
- The Demography Dynamics are also favorable as approximately 60 per cent of Indian population is below the age of 30.
- Increasing instances of Double Incomes in most families coupled with the rise in spending power.
- Increased urbanization has led to higher customer density areas thus enabling retailers to use lesser number of stores to target the same number of customers. Aggregation of demand that occurs due to urbanization helps a retailer in reaping the economies of scale.
- With increased automobile penetration and an overall improvement in the transportation infrastructure, covering distances has become easier than before. Now a customer can travel miles to reach a particular shop, if he or she sees value in shopping from a particular location[5].

Challenges which are faced by the Indian unorganized sector:

- Lack of best practice in inventory management and supply chain management.
- Lack of standardization.
- Stiff competition from organized retail sector.
- Lack of knowledge, skills and training.
- Consumers shifting towards organized retail markets.
- Lack of government policies discouraging the unorganized retailers.

IMPACT ON ORGANIZED SECTOR

The idea of demonetization is good but it has to be taken into consideration that most of the black money is kept in the form of land, buildings or gold or kept abroad. What is in cash constitutes only 4% of the total amount of black money on which taxes are not being paid. Out of this, a lot of money is in circulation in everyday transaction like if someone is building a house; the bill is not paid through banks for sand, bricks etc. This money goes into the other systems though it has been drawn from bank. These things will come under control with this step. The Government is not saying that 100% corruption will be tackled. If announcement and time would have been given, this step might not have been successful in controlling black money and counterfeit currency in circulation coming from Pakistan, Nepal or other countries[9]. This is a terrible setback for the international standing of the Indian economy. At this time, the economy is struggling with slowdown the stock of the black economy constitutes a major part of the GDP is significant. Even if 50% of this amount is withdrawn, the kind of relief that RBI will get on its liabilities and the sort of deposits commercial banks will get will lead to a rise in the deposit and later on there will be decrease in lending rates plus fiscal deficit [10]. Investment is not taking place in the economy and the rate of growth of capital formation is down. This will also make tendency of using Plastic Money which makes organized sector better, easy and fast. Real estate may see significant course correction:

The demonetization decision is expected to have far reaching effects on real estate. Resale transactions in the real estate sector often have a significant cash component as it reduces incidence of capital gains tax. Black money was responsible for sharp appreciation of properties in metros; real estate prices may now see a sharp drop[11]. Small farmers, sellers, merchants, daily wage laborers and traders are suffering because of lack of proper planning, intelligence and foresight such as recalibration of ATM machines. If we look at the farm sector, this is the harvest time. Farmers generally deal in cash and India is also largely a cash economy [12]. If suddenly implementing demonetization this sector suffering lot. People are facing problems because the limit of withdrawal has not been kept at a higher level. If this would have been kept at a higher level, there were chances that the recycling of black money might begin. In the tribal and farmers heartland of the country, the poor people through middlemen are getting their currencies exchanged for ₹ 300 or ₹ 400 because of lack of proper information which is hitting them. Temporarily unorganized sector buying capacity will decrease for examples purchasing of raw material, fertilizers, and selling cost. Majority of Indians unorganized sector have no knowledge about cashless transaction and resources also limited. When a poor farmer is unable to repay his small loan picking holes in the cashless economy five-six percent of the amount deducted in every digital transaction as service charge

CONCLUSION

The subsequent development of the Indian agriculture sector through FDIs is predicted to have a significant positive impact on the 700-million strong rural populations, living in about 600,000 small villages of India. Rapid investments in technology development, irrigation infrastructure, emphasis on modern agricultural practices and provision of agricultural credit and subsidies are the major factors contributed to agriculture growth. FDI in Indian agriculture sector increase employment opportunities. FDI remains permanent in the host country because of the development in the infrastructures of the host country. Therefore, there exist the long run relationship between level of GDP and foreign capital stock.

Ethical clearance: VLB Janakiammal College of Arts and Science, Coimbatore

Source of Funding: Self

Conflict of Interest: Nil

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DOI Number: 10.5958/0976-5506.2018.00158.4

Marketing Strategies of Home Based Women Entrepreneurs in Coimbatore District

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ABSTRACT

An organizer is a person who combines the various factors of production. He is a person who combines the factors of production to supply goods and services. The business may be agriculture, industry, trade or profession. He produces or buys socially valuable product and sells the produce in the market from which he pays to the suppliers of land, labour and capital. What remains is his profit. Thus organizer of a business enterprise is the coordinator and termed as Entrepreneur. The entrepreneur introduces new ideas, carries on new activities, coordinates the factors of production and decides how the business should be run. He anticipates the future trend of demand and price. He has vision, originality of thought and ability to take calculated risk.

Keywords: *Entrepreneurship, Marketing Strategies, Entrepreneur, labor, capital*

INTRODUCTION

Economic development has been a focal point right from the days of Adam Smith, the great economist. Development is both a physical reality and a state of mind in which the society has, through some combination of social, economic and institutional processes secured the means for obtaining a better life.

The development of the socio-economic condition of our people and development of economy in any form is the outcome of human activity. This activity in a man envisages three roles-as an organizer, worker and as user of the goods produced [1]. Of these, the role of man in organizing the factors of production is of immense importance. Unless the skills and resources provided by nature are fully transformed into efficient production units, man's labour will remain largely unproductive. These considerations focus attention on the importance of entrepreneurship in the development of any nation. The development of indigenous entrepreneurship is an imperative for a country committed to socio-economic development. But because of the relatively low value added the effect on informal income, and particularly wage income, is not significant. Similarly, services like security, local transport, hosting and event management, cleaning and laundry, cooking etc are bought by the organized sector as inputs [4].

Statement of Problem: This study is titled, "Marketing strategies by home based women entrepreneurs in Coimbatore District"

Need for the Study: Most of the literature in the books, journals and articles deal with the sociological psychological and demographic factors of women entrepreneurs. However, the segment of home based women entrepreneurs has not received the attention it deserves and they are not adequately addressed [2].

Home based women entrepreneurs are a special segment because they fulfil their entrepreneurial aspirations while they carry out their domestic duties all within the confines of their home. With a limited capital investment, limited space, limited market, inadequate knowledge about running an enterprise and with limited education and skills women entrepreneurs from home based sector has playing dual roles with great efficiency without compromising their home responsibilities. The focus of this study is to find out the reasons for starting this home based enterprises and the marketing strategies followed by the entrepreneurs to sell their products and services [3]. In the other, they produce as sub-contractors for formal sector firms. In all cases, the transmission

of income is hampered by the abysmally low wages prevailing in the informal sector, which results from low labor productivity [5]. At this time, the economy is struggling with slowdown the stock of the black economy constitutes a major part of the GDP is significant. Even if 50% of this amount is withdrawn, the kind of relief that RBI will get on its liabilities and the sort of deposits commercial banks will get will lead to a rise in the deposit and later on there will be decrease in lending rates plus fiscal deficit [6]. Now a day it's the best strategy used by marketers to influence customers by showing celebrities with their products, it includes different appeals lie, exciting, absurdity, sexual etc. Belch, G. [7] and Belch, M. [8] in his study even highlighted high brand revelation, longing, concentration and curiosity as the stepping stone for formulating strategies

OBJECTIVES OF THE STUDY

- To identify the inducing factors which motivate the women entrepreneurs to start the home based enterprises.
- To analyse the marketing strategies followed by the home based women entrepreneurs.

RESEARCH METHODOLOGY

Period of the study: The period of study for the study was a course of 2 months.

Study Area: The study is undertaken in Coimbatore District. It is popularly known as Manchester of south India, situated in the western part of Tamil Nadu which is well known for educational institutions, textile industry, upcoming IT Sectors. Thus Coimbatore District is chosen for the study.

Data source: Primary data have been collected by the interview schedule. Secondary data were collected from books, journals and websites.

Sample Frame: It was observed that home based enterprises were too widely scattered all over the district and also they are not in an organized sector or registered in government records, convenience sampling method is followed. 122 women entrepreneurs who are running the home based enterprises themselves are selected from various places of Coimbatore District.

Tools Applied: Statistical tool ranking is used to find out the inducing factors to start home based enterprises. Factor analysis is used to analyze the marketing strategies followed by the home based women entrepreneurs.

Limitations of the Study: The main limitations are:-

- This study is limited only to Coimbatore District
- Getting the information from the women entrepreneurs are not an easy job as they find no time to spare with and also they felt reluctant.

ANALYSIS AND INTERPRETATION

Percentage Analysis: The following table shows the type of business carried on by the home based women entrepreneurs. The frequency, percentage and the cumulative percentage are also shown. Table 1 expresses the statistical study of business units.

Table 1: Business units selected for the study

Products/ Services	Frequency	Percentage	Cumulative %
Food products	24	19.67	19.67
Garments	13	10.66	30.33
Exports	05	4.10	34.43
Jewellery	12	09.84	44.27
Beauty related business	18	14.75	59.02
Agencies	06	4.92	63.94
Health related products	10	8.20	72.14
Gift articles	10	8.20	80.34
Pest control chemicals	08	6.56	86.9
Tailoring	16	13.10	100.0
Total	122	100.00	

Majority of the sample respondents consisted of 24 food products producers and the least representation is from export business. There may be many inducing factors which motivate the women entrepreneurs to start the present enterprise. Some of the most important factors are identified and ranked below in Table 2:

Table 2: Ranking of Motivational factors for starting home based enterprise

		Family Improvement	To Earn More	Economical Indeprndence	Self Interest	Family Business	Technical& Professional Skills	Success stories of friends and Relatives	Others
N	Valid	122	122	122	122	122	122	122	122
	Missing	0	0	0	0	0	0	0	0
Median		4.00	5.00	4.00	5.00	5.00	3.00	5.00	5.00
Rank		2	4	2	4	4	1	4	4

The above table implies rank correlation regarding the factors for stating home based enterprise. The variable with lowest median will be considered as the most important factor and the factor with highest median will be considered of lowest important. As per the table, the factor Technical and Professional skills was considered as most important factor and ranked first. Factors positioned in second place were family improvement and economical importance. The other factors to earn more, self interest, family business, success stories of friends and relatives and other related factors were ranked fourth in the order of importance as motivating factor for starting home based enterprise.

FACTOR ANALYSIS

The dimensionality present status of women entrepreneurs was examined using factor analysis based on 10 individual statements and the reliability of the subsequent factor structures was then tested for internal consistency of the grouping of the items.

Table 3: Dimensions: Selection of Marketing Strategy by home based women Entrepreneurs KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.585
Bartlett's Test of Sphericity	Approx. Chi-Square	728.490
	df	45
	Sig.	.000

Kaiser-Meyer-Olkin measure of sampling adequacy index is 0.585, which indicates that factor analysis is appropriate for the given data set. KMO measure of sampling adequacy is an index to examine the appropriateness of factor analysis. High values between 0.5 and 1.0 indicate factor analysis is appropriate. Table 3 explains the marketing strategy of home based women entrepreneurs' kmo and bartlett's test. Values below 0.5 imply that factor analysis may not be appropriate. Bartlett's Test of Sphericity is used to examine the hypothesis that the variables are uncorrelated. It is based on Chi-square transformation of the determinant of correlation matrix. A large value of the test statistic will favour the rejection of the null hypothesis. In turn this would indicate that factor analysis is appropriate.

Bartlett's Test of Sphericity Chi-square statistics is 728.490, which would mean the 10 statements are correlated and hence as concluded in KMO, factor analysis is appropriate for the given data set. Total Variance Explained. Table 4 displays Principal Component Analysis (PCA) of Extraction Method.

Table 4: Principal Component Analysis (PCA) of Extraction Method

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.938	29.377	29.377	2.938	29.377	29.377
2	1.613	16.133	45.510	1.613	16.133	45.510
3	1.229	12.291	57.802	1.229	12.291	57.802
4	1.127	11.274	69.076	1.127	11.274	69.076
5	1.012	10.117	7.192	1.012	10.117	79.192
6	0.756	7.561	86.753			
7	0.479	4.789	91.542			
8	0.380	3.796	95.338			
9	0.305	3.046	98.384			
10	0.162	1.616	100.000			

Eligen Value represents the total variance explained by each factor. Percentage of the total variance attributed to each factor. One of the popular methods used in Exploratory Factor Analysis is Principal Component Analysis, where the total variance in the data is considered to determine the minimum number of factors that will account for maximum variance of data. Table 5 explains the Rotation Sums of Squared Loadings of statistical data.

Table 5: Rotation Sums of Squared Loadings of Statistical Data

Rotation sums of Squared Loadings		
Total	% of variance	Cumulative %
2.237	22..70	22.370
1.801	18.005	40.375
1.484	14.841	55.217
1.209	12.086	67.302
1.189	11.890	79.192

Rotation of factors is transferred through rotation into a simpler one that is easier to interpret. It does not affect the percentage of total variance explained. However, the variance explained by the individual factors is redistributed by rotation. The most commonly used method is Varimax rotation procedure. This procedure maximizes the variance of the loadings on each factor, thus minimizing the complexity of the factors. Table 6 display the component statistical analysis in details.

Table 6: Component Statistical Analysis

	Component				
	1	2	3	4	5
Direct Selling	.060	.071	.894	.008	.153
Selling through agents	.048	.773	.186	-.078	.245
Export	.217	.674	.392	-.104	-.253
Selling through friends and relatives	-.027	.827	-.225	.217	.039
Selling through family members	.870	.096	.263	-.149	-.110
Selling through employees	.852	.014	-.160	.169	.080
Online selling	.691	.060	.571	.177	-.064
Bulk sales to wholesaler / retailer	-.073	.055	.080	.121	.861
Sales through self help groups	.156	.096	.069	.873	.147
Others	.440	.188	.121	-.535	.505

Extraction Method: Principal Component Analysis

Rotation Method: Varimax with Kaiser Normalization

Intrepretation of factors is facilitated by identifying the statements that have large loadings in the same factor. The factors can be interpreted in terms of the statement that loads high on it.

Based on Eigen values that are greater than 1.0 in value, five factors are identified. Variables within each factor have been chosen based on component loading greater than 0.3 in value. Variables which get repeated in various factors are omitted since they contribute less.

From the Rotated Component Matrix table, "selling through family members" "Selling through employees" and "Online Selling" have a component loading of 0.3 and above. Hence, these variables form first factor.

In factor two, "Selling through agents" and "export" and "selling through friends and relatives" have a component loading of 0.3 and above.

In factor three, "direct selling" has a highest component loading

In factor four, "sales through self help groups" has a component loading of 0.3 and above.

In factor five, "bulk sales to wholesaler / retailer" and "others" have a component loading of 0.3 and above.

CONCLUSION

Direct selling, sales through self help groups, selling through family members, bulk sales, selling through employees and selling through friends and relatives are the six factors which contributed much for the selection of suitable marketing strategy.

The factor technical and professional skills was considered as most important factor and ranked first as the motivational factor to start the home based enterprise.

Through the women entrepreneurs are compromising the dual workload in the family and the business, they are able to shine in the business using their time, technical and professional skill, updating their knowledge about the marketing techniques and render the helping hand for the betterment of the family and the nation. Increased self confidence and economical independence have blessed these home based women entrepreneurs with a peaceful home and prosperous future.

Ethical Clearance: VLB Janakiammal College of Arts and Science, Coimbatore

Source of Funding: Self

Conflict of Interest: Nil

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DOI Number: 10.5958/0976-5506.2018.00159.6

Mediation of Attitude toward Advertisements in The Relationship between Advertisements and Purchase Intention

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ABSTRACT

In present bailiwick of sales promotion, advertisements act as an accelerating puppet to lure the customers to think about their products. The escalated competition between product promoters engulfed them to go back to very purpose of advertisement which is to inform, attract and create awareness about their products among the competitors. The momentous study examines the interrelationship between advertisements, attitude toward advertisements and purchase intention. Further some, this study concentrates on the mediating role of attitude towards advertisements in between the purchase intention and advertisements. The study was conducted among 320 common people from various walks of life in Chennai city was used for the study. The hypotheses were examined by linear regression and Sobel test. Findings reveled that both advertisements and attitude towards advertisements have a positive influence on purchase intention and also the mediating element attitude towards advertisements have a partial relationship between advertisements and purchase intentions.

Keywords: *advertisements, attitude toward advertisements, purchase intentions, mediation.*

INTRODUCTION

In today's world the advertisements are being treated as a lethal weapon to lure people towards creating awareness among competitors. People are purchasing more products based on the various advertisements. Advertisements have a great influence on the purchase intention of the persons who watch them (Kumar, S. D., et. al [13]. Hence the advertisements have a huge appeal on the customers which in turn increases the company profitability. Inspite of advertisements creating an effect on persons mind towards buying, it also gives a great impact on perception of choosing any product. This makes people to get mesmerized about the advertisements and make them create an urge to buy the product.

Then we should use that to be like them by Batra et. al [2] . From last 150 years advertising is changing in different phases from the classical to modern. Now a day it's the best strategy used by marketers to influence customers by showing celebrities with their products, it includes different appeals lie, exciting, absurdity, sexual etc. Belch, G. [3] and Belch, M. [4] in his study even highlighted high brand revelation, longing, concentration and curiosity as the stepping stone for formulating strategies. To do so, marketers attach famous personalities' with their products. McCracken [21] stated that these famous personalities' had great influence on the consumer's buying behavior that's why it becomes the most attractive tool of advertising now a day. The major aim to do advertising and adopt this strategy is to influence customers towards the products by Ohanian[23].

The universal truth of the advertiser's strategies is to steadily attract customer's attraction via message and to distinguish their offerings from their competitor's products with the aim to induce the purchase behaviour of the customer. The challenge that lies ahead is to include the use of a message advertisement. First, such a contended message attracts the audiences toward the advertisements which in addition, end with eye-catching and preferable products. Regular up-gradation of the content will yield in much more attraction and product popularity. There are numerous studies that incorporate the contented message serves as the building stone to enhance the feelings towards the ads. Great advertisements have become a connecting material among the company and the product promoters. By an effective advertisement, a company can make a heck of publicity and lure customers to consideration of their

products among other competitors. Various studies expose the influence of contended advertisements on individuals' mind-set towards short listing products which also interpolate the feelings of customers towards the advertisements and the promoted products as well. This may perhaps effect in improvement of acquisition plan and as an outcome in increase of trade.

REVIEW OF LITERATURE

Advertisement: The major destine of each commercial advertisement is to provoke attentiveness and excite the consumer's mind (Belch, G. E, et. al [4]. [3]). Due to reach of the advertisements among viewers it becomes a practice for every company to use advertisement as their basic & vibrant tool to encourage their goods and services, because of its unique way to convey information to the huge public in an effective and efficient manner(Mackenzie et al[20]; Lutz et. al[18]; Mackenzie al[19]). According to the consumer's purchase intention the advertising plays a crucial role, it becomes vital for the companies to use all the tracts and tools to peruse customers towards their offering by using different type of advertising campaigns by Ohanian[24].

Attention, awareness, attitude: This information has extended by and suggested by Chan et. al [6] that the celebrities' endorsements Kumar, S. D, et. al[14]are being used to get the attention of the customers (Aziz, S., Ghani, U et. al[1], by involving the best models in the advertisement and motivate people to get attention towards the product because this will ultimately raise the customer toward that company's product. Various study states that attitude of the advertisement get changed when good products and brand are being promoted by Homer, P. M [10]. In this process the message of the main motive of the product is explained by the well-known personalities. So they are more preferable by the companies for developing the awareness.

Purchase Intention: Purchase intention is a process by which a people search for the product/services they need or want, make decision to buy the required and most suitable one from different alternatives, use and the dispose it (Soundarapandiyan, K. et. al[33]) .For making marketing decision buying process model is playing a very important role for any one. It makes marketers to think about each step of this process rather than just purchase decision because if marketers just consider the purchase decision, it may be too late for a business to influence the choice of customers (Rao et. al[27]; Pradhan et. al[26]; Philps et. al[25] . According to this model the customer pass through all stages for purchasing every goods or services. However, in more regular purchases, customer often skips some the stages by Chnag et. al [7]. Some other factors influencing the buying behaviour are cultural, social, family, psychological parameters of individuals by Gresham et. al[9].

RESEARCH OBJECTIVES

- To explore the influence of advertisements on purchase intentions.
- To enquire the influence of attitude towards advertisements on purchase intentions.
- To investigate the mediating relationship of attitude towards advertisements among advertisements and purchase intention.

Conceptual framework & Hypotheses: The framework presented below represents the understanding of advertisements on buying behaviour and it also instigates the integrated model of understanding the mediation of attitude towards advertisements on purchase intention and advertisements. Figure 1 expresses the workflow of attitude toward advertisements in the relationship between advertisements and purchase intention.

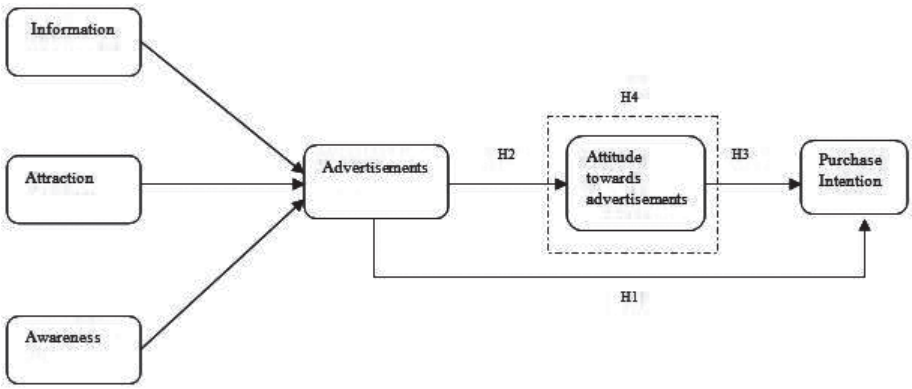

Figure 1: Workflow of Attitude toward Advertisements in the Relationship between Advertisements and Purchase Intention

H1: Advertisements have a positive affect purchase intentions.

H2: Advertisements have a positive affect attitude towards advertisements.

H3: Attitude toward advertisements has a positive affects purchase intentions

H4: Attitude toward advertisements mediates the relationship between advertisements and purchase intentions.

METHODOLOGY

Population and Procedures: The target population of the study is people from Chennai city. Structured questionnaire was the tool used to collect the data from the population (Reinbard et al[28]). The same was distributed among 400 respondents across various areas in Chennai. In this way we have received 320 completed questionnaires which yield an overall response rate of 80%. There are two categories of respondents "Male" and "Female" according to gender. There are 208 male and 112 female respondents in the sample that are 65% and 35% respectively.

Measurements: In this study advertisement is the latent variable although there are three components of advertisements: information, attraction and awareness. Advertisements are measured by adopting measurement items (Jin et. al [11]). The scale ranges from, 1 "Strongly Disagree" and 5 "Strongly agree".

Purchase intention is measured by adopting items from Lafferty and Goldsmith [15]. The scale consists of three items to measure purchase intention.

RESULTS AND INTERPRETATIONS

The items that are adopted for this study have been validated earlier by various researches and it is the proven items. However, to further confirm the validity and reliability of measures, we have assured construct validity by analyzing the results of correlations between all variablesas mentioned in Table 1. Discriminant validity has been confirmed by observing the bivariate correlation values of advertisements, attitude toward advertisements and purchase intentions which are (0.451, 0.448, and 0.380 respectively) less than the threshold value of 0.75 by Kline [12]. It exhibits that all three variables are significantly discriminant and distinct from each other.

The reliability of constructs and correlation values are exhibited in Table 1. The internal consistency or inter-item reliability of scales is measured by Cronbach's Alpha. The results reveal that the alpha values of all the three variables range from 0.81 to 0.86. The value of Cronbach's Alpha clearly indicates that all measures are reliable and in good range (greater than 0.80) by Sekaran[29]. Results of reliability and validity denote that all constructs are acceptable and reliable.

The mean, standard deviation and correlations among three key variables are presented in Table 1. It is observed from the results that all three variables are significantly and positively correlated with one another. The lower correlation coefficient values supported the absence of multi-co linearity issues in data.

Table 1: Correlation Matrix and Descriptive Statistics

	Variables	Ad	Aad	PI
1.	Advertisements (Ad)	(0.86)		
2.	Attitude towards advertisements (Aad)	0.451**	(0.81)	
3.	Purchase Intention (PIP	0.448**	0.380**	(0.82)

**p<0.01; (n= 309); Alpha values are along the diagonal in parenthesis

To test the proposed hypotheses, we run multiple linear regression models. Assumptions of regression were assured before testing the hypotheses. In order to check the normality of data, Kolmogorov-Smirnov test and Shapiro-Wilk test are applied which yield a significant p value (p<0.05) and it exhibits that the data fulfills the normality condition. Bivariate correlation values ranges from 0.38 to 0.448 for all three variables which refute issue of linearity among variables and furthermore it affirm absence of multi-collinearity issue in data (Montgomery et. al[22]).

Table 2 represents the regression results for hypotheses H1, H2 and H3. The Results reveal that advertisements positively and significantly associated with purchase intentions (β= 0.448, p<0.01). R2 value shows that brand credibility advertisements explain

20.1% variation in purchase intention. Hence, hypothesis one is fully supported by our data. In second step, advertisements and attitude toward advertisements are entered in the analysis. The regression results show that advertisements positively and significantly associated with purchase intentions (β= 0.451, p<0.01).The value of R2 shows that 20.4% variation in attitude toward advertisements is caused by advertisements. Our second hypothesis is also supported. Regression results also reveal that attitude toward advertisements significantly affect purchase intentions (β= 0.380, p<0.05) with R2 =0.145. Hence, our third hypothesis is also supported.

Table 2: Regression Results

Hypotheses	Path	R2	β	Sig.
H1	Advertisements Purchase Intention	0.201	0.448	0.000**
H2	Advertisements Attitude towards advertisements	0.204	0.451	0.000**
H3	Attitude towards advertisements Purchase Intention	0.145	0.380	0.000*

**p<0.01, *p<0.05

Mediation Analysis: We use Sobel test (Sobel et. al[32]) to examine the mediating effect of attitude toward advertisements among advertisements and purchase intentions. In Sobel test an indirect effect is measured that exist between independent variable and dependent variable. When mediator is introduced in the model, the coefficient value between independent and dependent variable may be reduced (partial mediation) or becomes insignificant (full mediation). The Sobel test results are explained in Table 3.

Table 3: Results for Mediation of Attitude toward Brand

		Purchase Intention		
	Independent Variables	**R2**	**Std. E**	**β**
Step 1	Advertisements	0.204	0.06	0.448**
Step 2	Advertisements		0.069	0.347**
	Attitude towards Advertisements		0.059	0.224**

**p<0.01,*p<0.05

In step one; we can observe the direct path (coefficient value 0.448) without mediator. The step two clearly indicates the drop of coefficient value from 0.448 to 0.347 when the mediator is introduced in the model. Even after inclusion of mediating variable attitude toward brand the coefficient value dropped but was significant. Thus, attitude toward advertisements partially mediates the relationship between advertisements and purchase intentions. Hence, our hypothesis four is supported.

Type of Mediation – Significant / Partial
Sober z – value =3.523 P = 0.000427

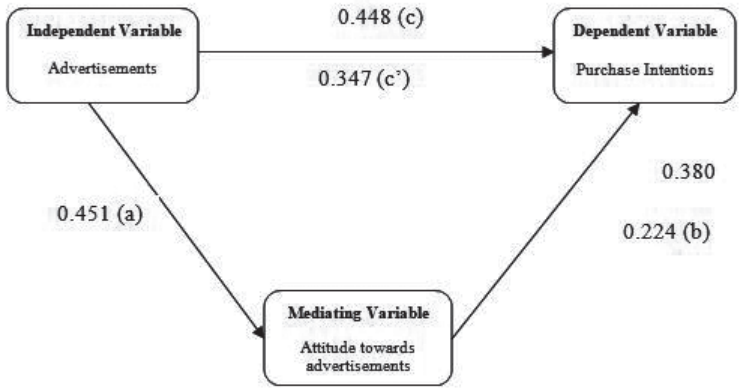

Figure 2: Results of Sobel Test for Mediation

An online calculator provided by Leisching et. al [17] is used to estimate the mediation effects of attitude toward advertisements between advertisements and purchase intentions. The test yields Sobel z-value 3.52 significant at $p<0.01$. Figure 2 elaborates the results of Sobel test for mediation in detasils. The test results reveal that attitude toward advertisements act as a significant mediator between advertisements and purchase intentions and there exist a partial mediation in this model. After inclusion of mediator the direct effect between advertisements and purchase intentions is 0.347 and indirect effect of attitude toward advertisements is 0.101 in the model.

DISCUSSION

The main aim of this study was threefold; a) to empirically examine the relationship between advertisements, attitude toward advertisements and purchase intentions, b) to investigate the mediating effect of attitude toward advertisements in understanding the relationship between advertisements and purchase intentions, c) to test the conceptual model that represents the direct impact of advertisements on purchase intentions and its indirect impact through attitude toward advertisements by Sheraz et. al[29].

The findings of first hypothesis confirm that advertisements have positive and significant impact on the purchase intentions of consumers. These results are consistent with prior research studies on advertisements hence, we can say that if advertisements are perceived as credible by consumers it will exert a positive influence on consumers and will increase the intentions of consumers to buy the product.

The results of our second hypothesis reveal that advertisements have positive and significant impact on the attitude toward advertisements. These results are consistent with the previous studies by Goldsmith et. al [8]; Lafferty et. al[16]; Brinol et. al[5]. It shows that when credibility of advertisements is high then consumers will have positive attitude toward the advertisements.

Our third finding shows that attitude toward advertisements have positive and significant impact on the purchase intentions of the consumers. The results of the study regarding attitude toward advertisements and purchase intentions are consistent with previous studies conducted on same issue by Tsang et. al [34]. We can claim that when consumers have positive attitude toward advertisements then it will exert influences on the purchase intentions of the consumers.

Finally, the mediation results show that attitude toward advertisements mediates the relationship between advertisements credibility and purchase intentions (Shimp et. al [31]). The mediated relationship between advertisements and purchase intentions is tested by Sobel test. The results confirm that partial mediation exists in the model. This implies that advertisements change the attitude of consumer and then in turn attitude affects the purchase intentions of the consumers.

CONCLUSION

This study communicates the importance of advertisements and attitude toward advertisements in Chennai city. The empirical results confirm that both advertisements and attitude toward advertisements simultaneously impact purchase intentions of consumers. The analytical results reveal that attitude toward advertisements partially mediates the relationship between advertisements and purchase intentions. The findings suggest that advertisements are helpful to increase the attitude toward advertisements and as a result attitude toward advertisements affects purchase intentions of consumers. Hence, marketers should focus on attitude toward advertisements along with advertisements in order to increase purchase intentions of consumers.

Ethical Clearance: Bharathiyar University, Coimbatore

Source of Funding: Self

Conflict of Interest: Nil

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DOI Number: 10.5958/0976-5506.2018.00160.2

Determination of Breast Cancer Using KNN Cluster Technique

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ABSTRACT

The proposed method to inspect of association between absorption related protein communication profiles and facility obsessive attributes in a huge of bosom tumor patients. Pictures to modifies in the internal breast structure owing to the configuration of masses and MicroCalcifications (MC) for the identification of breast cancer is called as mammography. The execution assessment investigates standard and datasets, while the principle application was lead by utilizing Breast Cancer dataset which were taken from the MIAS Machine learning warehouse. For these datasets, the execution of information lessening process was contrasted and k-nearest neighbor algorithm implies gathering computation in which Multilayer Perception and Artificial Neural Networks utilized as a classifier after the information structure. The main goal is to make these distinctions or defect our solid point for full recognition of breast cancer from discovers the malignancy zone. The methodological discoveries the identity for breast cancer and detect breast tumor of data mining.

Keywords: *Breast Cancer, Mammograms, k-nearest neighbor algorithm (KNN), Multilayer Perception and Artificial Neural Networks, MicroCalcifications (MC)*

INTRODUCTION

Some preparatory information pre-handling steps thought to be lead before mining in information. A few methodologies can be considered for information for instance irregular inspecting of current dataset. Grouping is another contrasting option to decrease the quantity of tests by taking just bunch agent test for all specimens in a group. Bosom disease is the most widely recognized kind of malignancy influencing ladies around the world. It is the second most basic sort of growth in ladies in the United States. An investigation directed in 2015 recommends that more than 2.8 million ladies in the US have a background marked by bosom disease. In view of noteworthy mortality and grimness caused by this pervasive growth, broad research on this disease keeps on being led worldwide so as to distinguish causes and arrangements. All through life ladies experience hormonal changes. The impacts of these hormones, for example, progesterone, prolactin and estrogen, result in typical development and division of bosom tissue and other female conceptive organs. Premature birth, which is an exceptionally regular method, is widely done around the world, today. Joined States authorized the methodology in 1973 in the outstanding, however dubious, Roe versus Wade choice. According to the measurements, consistently around 20 – 30 million legitimate premature births are performed around the world.

The connection between actuated premature birth and the ensuing improvement of bosom disease has been the subject of a generous measure of epidemiological examination. Early investigations of the connection between earlier instigated premature birth and bosom growth hazard were methodologically imperfect. More thought late investigations show no causal connection between actuated premature birth and a resulting increment in bosom malignancy hazard. In any case, there have been a few investigations previously that demonstrated an expanded danger of bosom growth in patients who have had premature births. A couple of articles even recommend that fetus removal expands the odds of bosom tumor by three times. These articles likewise express these ladies younger than 18 who are experiencing fetus removal have double the odds of creating bosom disease. Different investigations propose that the prior in life a lady has her initially full term pregnancy; there is a diminished possibility of the improvement of bosom tumor.

RELATED WORK

In many cases, they perform better than standard statistical tools. In [1] described Missing data imputation using statistical and machine learning methods in a real breast cancer problem. One of the advantages of the use of machine learning models was that they are usually much more flexible than the standard statistical models and can capture higher-order interactions between the data, which results in better predictions. On the other hand, the predictions were made based on complex relationships between the data, and as a result the interpretability of the results was more difficult, even if tools extracted the knowledge acquired by these models. Thus, these alternative models were often criticized. Prognosis models in breast cancer survival analysis were usually constructed from records that include clinical and histopathological information[2].

Several imaging techniques for examination of the breast included magnetic resonance imaging, ultrasound imaging, and X-ray imaging. Mammography was a particular kind of picture and utilized a little-quantity X-ray framework to examine the breast, and currently the most effective method for detection of breast cancer before it becomes clinically palpable. Paper [3] described by Computer-aided identification and analyzed of breast tumor with mammography pictures. Mammography offered high-quality images at a low radiation dose, and it widely accepted imaging method used for routine breast cancer screening. Breast cancer diagnosis on three different datasets using multi-classifier paper was described by [4]. Performed supervised methods required sufficient numbers of DNA microarray samples in order to form both training and independent validation data sets. In [5] [6] described an application of DNA microarray technology in determining breast cancer prognosis and therapeutic response. In cases, the number of samples was limited, differentially expressed genes were simply ranked and these genes should be validated using experimental approaches such as quantitative reverse transcriptase PCR analysis. Due to the high level of noise in the data, limited numbers of samples and the extensive number of variables fold change or classical t-tests may detect many false positive genes. As this would be unacceptable, it has resulted in the development of a modified or moderated t-statistic, where the variance of gene expression is replaced by a variance estimate that is modeled from many genes. KNN algorithms are known especially with their simplicity in machine learning literature. They are also advantageous in that the information in training data was never lost. But, there are some problems with them. First of all, for large data sets, these algorithms are very time consuming because each sample in training set is processed while classifying a new data and this requires longer classification times [7] [8] described a hybrid methodology based on fuzzy-artificial immune framework and KNN algorithm for breast tumor analysis utilizing mammography pictures. It cannot be problem for some application areas but when it comes to a field like medical diagnosis, time was very important as well as classification accuracy. The first present an overview of these methods with an emphasis on their computational efficiency [9]. Then compare eight commonly used linear time complexity initialization methods on a large and diverse collection of data sets using various performance criteria. Finally, it analyzed the experimental results using non-parametric statistical tests and provided recommendations for practitioners. The popular initialization methods often perform poorly and that there are in fact strong alternatives to these methods. Previous analysis of the breast cancer patients, clustering data mining algorithm utilized to identify breast cancer[10] [11].

In [12] illustrated very helpful to doctor for investigate breast tumor and supportive to patients for beginning treatment. The task is to learn a classifier that optimizes accuracy, but does not have this discrimination in its predictions on test data preprocessing techniques for classification without discrimination. In the problem is relevant in many settings, such as when the data are generated by a biased decision process or when the sensitive attribute serves as a proxy for unobserved features. Concentrate on the case with only one binary sensitive attribute and a two-class classification problem. In [13] discussed theoretically optimal trade-off between accuracy and non-discrimination for pure classifiers were illustrated. Then, look at algorithmic solutions that preprocess the data to remove discrimination before a classifier is learned. Survey and extend our existing data preprocessing techniques, being suppression of the sensitive attribute, massaging the dataset by changing class labels, and reweighing data to remove discrimination without relabeling instances. The system assumes distinguishing malignant from benign cases. In [14] described an alternative to the previously presented algorithms based on fuzzy c-means clustering and

competitive neural network. However, it uses similar idea of combining clustering in RGB space with adaptive thresholding. At first, thresholding reveals objects on background. Then image is clustered with k-means algorithm to distinguish nuclei from red blood cells and other objects. In [15] developed segmentation and it crucial to obtain good quality features measurements and consequently successful diagnosis. The system of malignancy classification was tested on a set of real case medical images with promising results.

PROPOSED SYSTEM

Mammography is a strategy to discover tumor in the breast and it useful for the radiologists to identify the tumor. Radiologists sometimes miss the variations of the rule because in the field of tumor identification. Segmentation is significant for radiologists to investigate the information in the breast tumor. Breast cancer accuracy in mammogram investigation is depends upon the picture segmentation of clustering methodologies. The k-means algorithm have been generally investigated and applied in a various kinds of applications.

The Cluster analysis has been extensively utilized as a part of numerous methodologies, containing preprocessing, segmentation, feature extraction and classification. Clustering is called information segmentation in several methods since clustering segments of large informational indexes into groups as indicated by their comparability. The k-means algorithm also called to information is the most routinely utilized strategies for clustering which follows one bit of information to have a place with at least two groups. In the strategy created and improved and it is frequently utilized in feature extraction classification, picture segmentation, and so forth. Figure.1 shows the work flow of breast cancer classification.

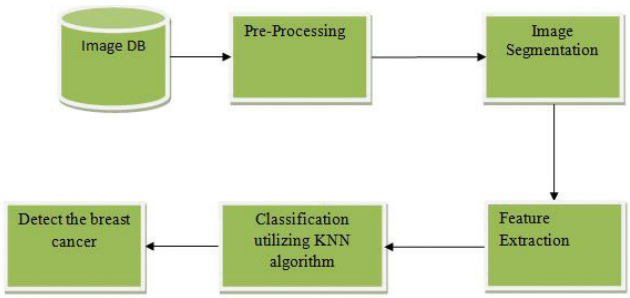


Figure1: Work Flow of Breast Cancer Classification

PRE-PROCESSING

Mammographic pictures are regularly influenced by different kinds of noise. Deletion of these noises without destroying the preferred data is frequently a major challenge. In the progression, the provided mammogram is preprocessed utilizing de-noising and upgrades methods so that the removed features can be effortlessly discernable for every class. The difference of mammogram picture is upgraded by applying histogram equalization strategy. The strategy is applied to in frequency area of the picture and it permits the improvement of the huge frequency values and decrement of the less frequency values.

IMAGE SEGMENTATION

Various kinds of segmentation techniques are presented and the most mainstream strategy is k-means clustering algorithm. The k-means clustering algorithm is an unsupervised learning algorithm and it is utilized to segment the regions of interest area from the background. Before applying K-means clustering algorithm, first incomplete extending enhancement is connected to the picture to enhance the quality of the picture. The segmentation is to extract Region of interests (ROIs) including all masses and find the suspicious mass applicants from the ROI. Region developing is the most prominent strategies to segment areas in pictures. Given, an initial pixel or area, associating pixels or regions are included if their properties are similar to the previously segmented area. Finally, medial filter is applied to the segmented picture to expel any undesirable area from the picture.

FEATURE EXTRACTION

After the segmentation is performed on breast region, the features can be acquired from it and the analysis rule can be intended to precisely identify the tumor knobs in the breasts. The execution of any framework can be influenced by the features extracted in this step. The nature of a protest is illustrated utilizing its aspects. It can be any numerical depiction which is utilized to separate among two classes (benign/malignant) and more than two classes. The classification framework utilizes them to detect the area of abnormalities and offers a final result. To classify the provided mammogram into benign or malignant, aspects are extricated utilizing k-means from the ROI which incorporates the suspicious area of tumors.

CLASSIFIER

An efficient classification strategy based on KNN is developed. Before the development of KNN, the aspect vector is formed by integrating k-means aspects of every band for the characterization and stored in the database. In KNN, features or information is illustrated by a hierarchical information structure during a separation and conquer technique. It is communicated as far as cyclic partition of aspect space. KNN comprises a various hubs relies upon the aspect space. It begins with the primary hub called as root, and the remaining is called as leaves. Provided dataset or tests, best KNN is developed with that the mistake is negligible. The price function is upgraded in KNN so that a KNN is built. A progression of test inquiries and conditions are set up by KNN.

RESULT AND DISCUSSION

Experimental Result: MIAS database pictures are utilized to examine the execution of breast tumor classification framework. It has numerous kinds of mammograms which incorporate MCs, estimated masses, encompassed masses, architectural distortion and normal mammograms. All benign (51 pictures) and malignant (64 pictures) pictures are considered and isolated from every one of the classes of mammograms and utilized for the investigation. Figure 2 demonstrates an example benign and malignant picture in MIAS database.

Sensitivity: Sensitivity calculated as a total amount of true positive images over an amount of actual positive images. It can be represented as follows:

$$\text{Sensitivity} = \frac{TP}{(TP + FN)}$$

Where TP = True Positive images and FN = False Negative images

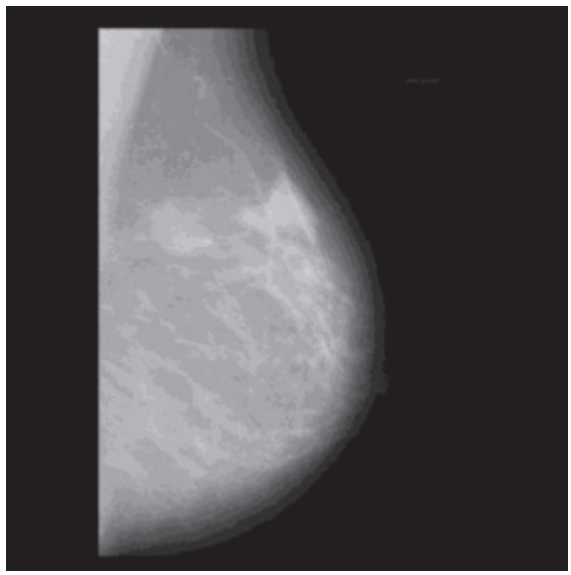
Specificity: The specificity computed as the number of true negative values over number of actual negative values. It can be represented as follows:

$$\text{Specificity} = \frac{TN}{(FP + TN)}$$

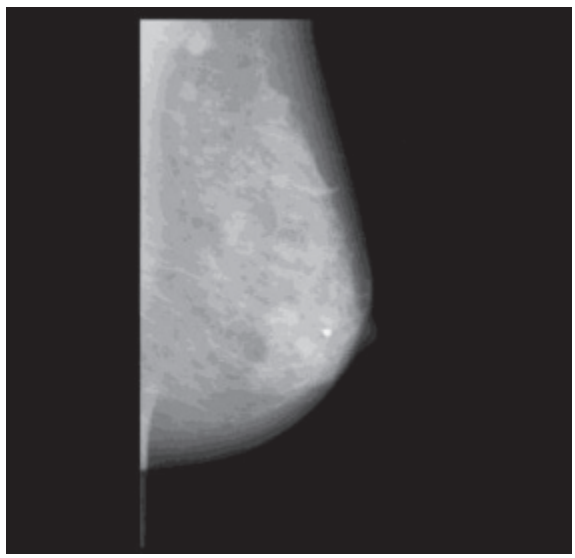
Where TN = True Negative values and FP = False Positive values.

Accuracy: Accuracy is the majority of general estimation strategy to compute the performance of the classifiers. Accuracy has been calculated depends on the amount of correctly classified usual/unusual pictures to estimate the effectiveness and robustness of the classifier. The evaluation metric is as follows:

$$\text{Accuracy (\%)} = \frac{\text{Total number of correct classification}}{\text{Total number of tested pattern}} \times 100$$



(a)



(b)

Fig. 2: (a) Benign mammogram (b) Malignant mammogram

Every one of the pictures are deteriorated utilizing k-means, and the acquired k-means coefficients are utilized as features and are stored for categorization phase. KNN classifier categorizes the picture into benign or malignant is utilized for the categorization. Table 1

indicates different constraints estimated for the breast tumor classification framework.

Table 1 proposed KNN classifier illustrates the identify time taken, classified correctly and incorrectly classifier for numerous input method. Based on tabular result clarification, it can be said that the proposed approach performs well compare than previous techniques.

Table 1: Evaluation of Breast Tumor Classification Framework

Image Type	Total Images	Classified Correctly	Classified Incorrectly	Sensitivity (%)	Specificity (%)	Accuracy (%)
Benign	51	60	4	96.1	93.8	94.8
Malignant	64	49	2			

It is incidental from table 1 that the breast tumor classification framework provides enhanced outcome in terms of sensitivity (96.1), specificity (93.8), and accuracy (94.8). Along with the 51 malignant pictures, only two pictures are classified incorrectly. Receiver Operating Characteristic (ROC) curve of breast cancer classification framework is exposed in Figure 3.

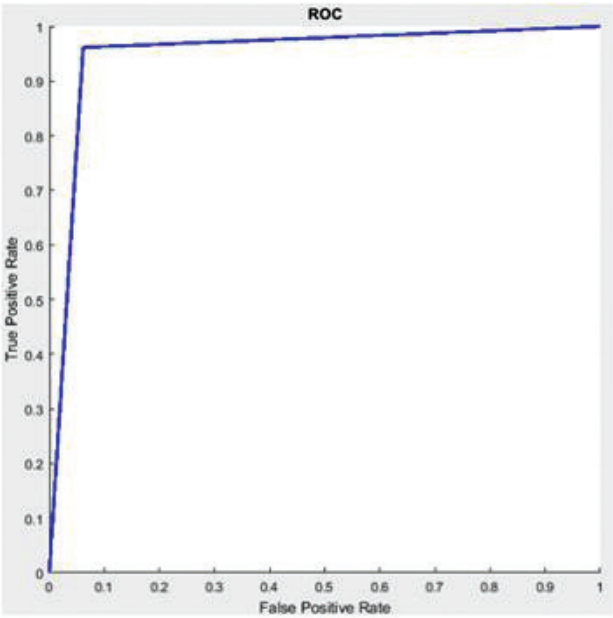


Figure 3: ROC Curve of Breast Tumor Classification Framework

CONCLUSION

KNN is utilized to classify the mammogram pictures. Subsequent to preprocessing utilizing histogram equalization, ROI picture is edited and provided as an input to the feature extraction phase. The acquired coefficients of the k-means are utilized to remove the mammogram attributes. The breast cancer pictures are sorted into benign or malignant by KNN classifier utilizing k-means attributes. The acquired accuracy is 94.9% while the sensitivity and specificity are 93.8% and 96.1% correspondingly. Outcomes demonstrate the breast cancer classification framework gives quick and accurate outcomes to UCI database breast pictures.

Ethical Clearance: Mother Teresa Women's University

Source of Funding: Self

Conflict of Interest: Nil

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DOI Number: 10.5958/0976-5506.2018.00161.4

Determination of Cognitive Variation from Brain MRI Analysis

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ABSTRACT

Brain MRI analyzing is a technique used to diagnose commonly occurring malignancy in human brain. It's a known fact that human brain size varies as age increases. The etiology is that huge differences in brain size are usually unknown. Here the work propounds an image segmentation method to indentify and detect tumor using the technique called brain magnetic resonance imaging (MRI). Discrete Wavelet Transform (DWT) based classification of Magnetic Resonance Images (MRI) of the cerebrum is been analyzed effectively. There developed many thresholding methods but they have different result in each image. The work encourages finding the major causes of brain tumor leading to the increased mortality rate among children and adults. Magnetic resonance imaging (MRI) is a commonly used modality to image brain. MRI provides high tissue contras hence the existing brain image analysis methods have often preferred the intense information to others, such as texture. An easy technique to compute consistency descriptor that shows the brain size variations in some common MRI artifacts that make it possible to make a high level brain MRI analysis. A new technique is implemented to extract the suspicious region in the Segmentation of MRI Brain tumor utilizing DWT. So, the detection technique can be useful for further consideration of medical practitioners. Predefined families of wavelets such as Daubechies (db8), Symlets (sym8) and Biorthogonal (bio3.7) are been utilized. From the resource, information is extracted and provided as an input to the identification and to the classification step. Finally, the cerebrum pictures are categorized by Support Vector Machine (SVM) classifier to detect whether it is usual or unusual. An outcome demonstrates that db8 filter offers higher accuracy than other wavelets.

Keywords: *segmentation, threshold, image, Daubechies (db8), Symlets (sym8) and Biorthogonal (bio3.7), by Support Vector Machine (SVM), Discrete Wavelet Transform (DWT) , magnetic resonance imaging (MRI).*

INTRODUCTION

Brain image analysis covers a numerous factors from diagnosis to understanding of neurodegenerative diseases. MRI is the preferred modality for imaging the brain as it provides excellent intensity contrast among several tissue types. The literature has mainly concentrated on using MR intensity values in the analysis of brain MR images. The structural information in the form of texture has been computationally extracted although texture information can complement MR intensity and remedy some of the inherent intensity-related problems. The National Brain Tumor Foundation for research in United States estimates that 29,000 people in the U.S are diagnosed with primary brain tumors each year, and nearly 13,000 people are prone to death. In children, brain tumors are the cause of one quarter of all cancer deaths. The overall annual occurrence of primary brain tumors in the U.S is 11 - 12 per 100,000 people for primary malignant brain tumors, that rate is 6 - 7 per 1,00,000. In the UK, over 4,200 people are diagnosed with a brain tumor every year (2007 estimates). There are about 200 other types of tumors diagnosed in UK each year. About 16 out of every 1,000 cancers diagnosed in the UK are in the brain (or 1.6%). In India, totally 80,271 people are affected by various types of tumor (2007 estimates). Although, it has been recognized over a century and there are fairly marked individual differences in brain size among normal individuals (Gould, 1981). Both the etiology of such size differences and their relation, if any, to individual cognitive differences are less well understood. It is known that genetic disorders can lead to extreme variations in brain size, which are usually accompanied by mental retardation.

RELATED WORK

Paus[1] described over the past decade, structural-MRI studies provided the first comprehensive picture of age-related changes in the volume of grey and white matter of typically developing children and adolescents Mapping brain maturation and cognitive development during adolescence. Thompson et al. [2] reported on detailed three-dimensional maps revealing how brain structure was influenced by individual genetic differences. A genetic continuum was detected, in which brain structure was increasingly similar in subjects with increasing genetic affinity. Genetic factors significantly influenced cortical structure in Broca's and Wernicke's language areas, as well as frontal brain regions (r2 MZ > 0.8, $p < 0.05$). Preliminary correlations were performed suggesting that frontal gray matter differences may be linked to Spearman's g, which measures successful test performance across multiple cognitive domains ($p < 0.05$). The genetic brain maps revealed how genes determined individual differences, and may shed light on the heritability of cognitive and linguistic skills, as well as genetic liability for diseases that affect the human cortex. Wardlaw et al. [3] focused on reliable, fully automatic methods for quantifying all features of aging on MRI, whether focal or diffuse, normal anatomical structures or otherwise, does not yet exist Brain aging, cognition in youth and old age and vascular disease.

Bullmore et al [4] discussed the T1-weighted, T2-weighted and proton density-weighted images of the brain Contrast in structural MR images was based on local differences in proton density, that is, in the number of hydrogen nuclei per unit of tissue volume, or in either of the following two relaxation times: (i) longitudinal relaxation time (T1); and (ii) transverse relaxation time (T2). Local differences in relaxation times are reflected in the image contrast because, at a given measurement time, the MR signal has already recovered more in regions with a short T1, or decayed more in regions with a short T2. For this reason, tissue with short T1 showed a high MR signal and appears bright on T1-weighted images, whereas tissue with long T2 showed a high signal and is bright in T2-weighted images Complex brain networks: graph theoretical analysis of structural and functional systems. Kesler et al. [5] utilized a combined approach of qualitative visual rating scales performed by expert dialogists and computational image processing methods, both performed blind to all subject and imaging data. In some cases, where a similar metric is measured, e.g. WML score and volume, then the qualitative and quantitative methods are complementary and act as validation tools. Poldrack [6] described a cognitive reserve theories have been postulated in an attempt to explain individual differences in functional outcome following cerebral insult or disease premorbid intellectual functioning, education, and brain size in traumatic brain injury: an investigation of the cognitive reserve hypothesis.

Lenroot et al.[7] suggested the theories that higher education and psychometric intelligence may preserve functional capacity regardless of injury or disease severity. The study investigated cognitive reserve in 25 participants with traumatic brain injury using high-resolution magnetic resonance imaging (MRI) analyses. The paper examined the relationships between total intracranial volumes (TICV), ventricle-to-brain ratio (VBR), education level, and standardized testing obtained prior to injury with post-injury cognitive outcome the brain development in children and adolescents: insights from anatomical magnetic resonance imaging. Locke et al. [8] presented a study addressed the question from the participants performed a cognitive task (AX variant of the Continuous Performance Test; AX-CPT) under three different blocked motivational conditions (reward-incentive, penalty-incentive, and baseline). Behavioral data showed that the incentive conditions modulated task performance, potentially by altering participants' cognitive control strategy. Neuro-imaging data indicated that the reward condition was associated with a sustained increase in a primarily right-lateralized network that included parietal and prefrontal cortex. Fan et al. [9] founded a polymorphism in which persons with the allele associated with better behavioral performance showed significantly more activation in the anterior cingulated while performing the ANT than those with the allele associated with worse performance. The results of the paper demonstrated how genetic differences among individuals can be linked to individual differences in neuro-modulators and in the efficiency of the operation of an appropriate attentive network. Fox et al. [10] discussed the spontaneous fluctuations in the blood oxygen level dependent (BOLD) signal of functional magnetic resonance imaging as a potentially important and revealing manifestation of spontaneous neuronal activity. Although several challenges remain, the study have provided insight into the intrinsic functional

architecture of the brain, variability in behaviour and potential physiological correlates of neurological and psychiatric disease.

Watkins et al. [11] elucidated brain morph metric measures are highly variable across individuals and there was considerable overlap amongst groups of boys versus girls, typically developing versus neuropsychiatric populations, and young versus old. Studies were performed and explored the influences of genetic and environmental factors on developmental trajectories. In the method revealed a number of mainly motor- and speech-related brain regions in which the affected family members had significantly different amounts of grey matter compared with the unaffected and control groups, who did not differ from each other MRI analysis of an inherited speech and language disorder: structural brain abnormalities. Cohen et al. [12] explained several of these regions were abnormal bilaterally, including the caudate nucleus, which was of particular interest because this structure was also found to show functional abnormality in a related PET study. The paper performed more detailed volumetric analysis of this structure. The results confirmed that the volume of this nucleus was reduced bilaterally in the affected family members compared with both the unaffected members and the group of age-matched controls. The reduction in volume was most evident in the superior portion of the nucleus.

Neil et al. [13] demonstrated that MRI patterns have shown sharp transitions in correlation patterns and that these supposed areal boundaries can be reliably detected in individual subjects as well as in group data. In addition, combined surface-based analysis techniques with image processing algorithms allowed automated mapping of putative areal boundaries across large expanses of cortex without the need for prior information about a region's function or topography. Lim et al. [14] discussed a reliable approach produced maps of bounded regions appropriate in size and number for putative functional areas. The findings hopefully stimulated further methodological refinements and validations. The images are then filtered to correct for radiofrequency in homogeneity image artifacts. Late echo images are subtracted from or added to early echo images to enhance fluid/tissue and gray/white tissue contrast; respectively Thresholds for fluid/tissue and gray/white separation are set interactively. Raz [15] suggested a boundary pixel locking algorithm used to handle ambiguities due to partial voluming between the fluid and tissue compartments. The MR brain scans from five healthy, young, normal men were obtained using a standard neuro anatomical reference technique. Those data were processed and percentages are computed for fluid, gray matter and white matter compartments. The gray/white ratios compare favorably with those determined in a published postmortem brain study.

PROPOSED METHOD

Image segmentation algorithm is subsisted to overcome the complexity problems, the separation result is either of an image of marks recognizing each homogeneous district or an arrangement of forms which describe the local limits. Magnetic Resonance Imaging (MRI) is a generally utilized technique for investigating the workings of the human cerebrum using Discrete Wavelength Transform (DWT). In the variation, known as intensity in homogeneity no uniformity or bias field has little impact on visual diagnosis, but its impact on the performance of automatic segmentation methods can be catastrophic due to increased overlaps between intensities of different tissues. A common solution for this problem is registration, which may not be favored in some applications due to its computational expense and complexity.

Threshold method using volume and intensity distribution are usually very complicated in medical images and often fail. In most cases, threshold determination method is combined with other methods. One of these methods is segmentation based on threshold. In threshold method, a region is separated based on pixels with similar intensities. In the method provides boundaries that separate objects from background based on their contrasts.

One of these methods is called general thresholding in which it is assumed that pixels of target and background have differences in gray surface and threshold is selected so that the target is separated from background. In the method is used when thresholding is not constant and the threshold is specified based on the location of target. To select the threshold, there are various methods including selection of threshold with the help of histogram, clustering and iteration. In threshold determination methods, measurable images are divided of intensities to separate desired classes by the value of amount called threshold.

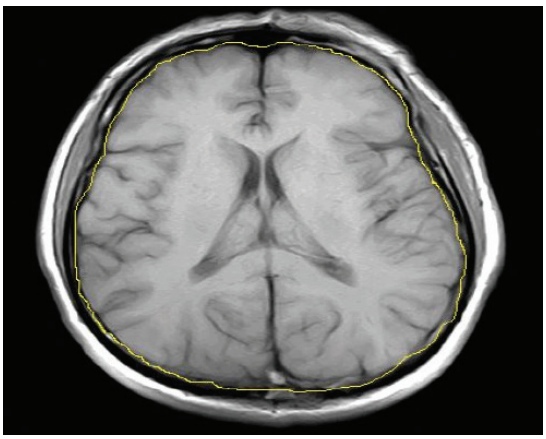

Fig. 1: Analysis for Brain variation

Preprocessing: Preprocessing is the fundamental step in several machine learning systems. The middle channel is utilized to de-noise a picture from the provided MRI cerebrum picture. After that the de-noised pictures are provided as input to the following step to separate the attributes utilizing DWT strategy. Figure 1 demonstrates the MRI cerebrum ordinary picture and MRI cerebrum unusual picture separately.

Feature Extraction utilizing DWT: Subsequent to preprocessing, the steps for attribute extraction incorporate DWT decay. The coefficients of DWT of MRI cerebrum pictures are estimated. Db8, Sym8, and bio3.7 are the wavelet channels which are utilized for extracting energy attributes. According to the spatial data, recurrence data of given input information is caught by DWT. These data's are gotten by decaying the provided input information by DWT by means of the low pass and high pass filtering. The previous filtering creates coarse estimation, and the later filtering procedure provides detail information's. The multi-determination of provided input information is gotten by offering the coarse estimation as contribution to DWT procedure until when it achieves the required level of decay.

Classification: The extracted attributes are connected to the SVM to decide the type of MRI. It is one of the state-of-art learning methods utilized for characterization. Numerous examinations demonstrate its calculation points of interest with better exactness over conventional learning approaches. It can perform binary and multi-class characterization assignments. However, parallel SVM is utilized as a part of this examination as the framework classifies the provided input as usual/unusual. RBF Kernel work is utilized as a part of this framework. Finally, appropriately extracted attributes are classified by the SVM classifier.

RESULT AND DISCUSSION

The framework is tested on a clinical MRI dataset. Sum amount of MRI cerebrum pictures in the dataset is 100. The cerebrum pictures with lesions are classified into unusual pictures and without injuries are classified into usual pictures by specialists. Every category includes 50 MRI cerebrum pictures. Chosen pictures are provided as input to the preprocessing step to de-noise a picture. Next attributes are extracted utilizing DWT coefficients. Lastly, characterization is accomplished by SVM classifier whether it is a usual or unusual picture. Table 1 demonstrates the general exactness of the technique utilizing DWT features and SVM classifier.

Accuracy: Accuracy is the majority of general estimation strategy to compute the performance of the classifiers. Accuracy has been calculated depends on the amount of correctly classified usual/unusual pictures to estimate the effectiveness and robustness of the classifier. The evaluation metric is as follows:

$$\text{Accuracy (\%)} = \frac{\text{Total number of correct classification}}{\text{Total number of tested pattern}} \times 100$$

Table 1 explains the accuracy of usual and unusual pictures for different DWT decay wavelength in SVM classifier. Table 1 demonstrates the average value on all respective estimation matrix & input parameters such as Daubechies (db8), Symlets (sym8) and Biorthogonal (Bio3.7). According to Table1, it was noticed that the proposed DWT with SVM classifier performs well on all estimation matrixes and input images.

Table 1: Accuracy of dissimilar wavelet filters in MRI brain picture classification

DWT decay level	Usual			Unusual		
	Db8	Sym8	Bio3.7	Db8	Sym8	Bio3.7
1	77	71	69	79	73	71
2	83	81	77	85	83	77
3	89	85	83	90	85	81
4	93	89	89	96	91	89
5	91	85	83	91	83	79

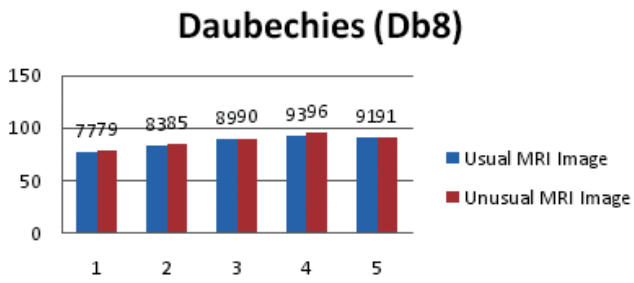

Figure 2: Daubechies (Db8) for 1, 2, 3, 4, 5 DWT Decay Wavelengths

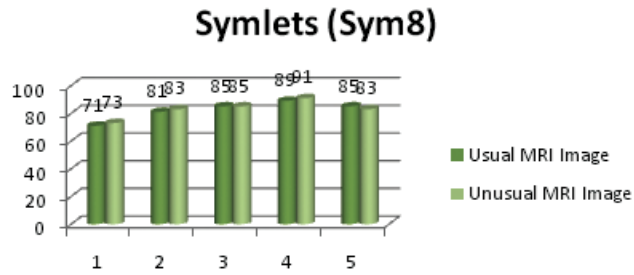

Figure 3: Symlets (Sym8) for 1, 2, 3, 4, 5 DWT Decay Wavelengths

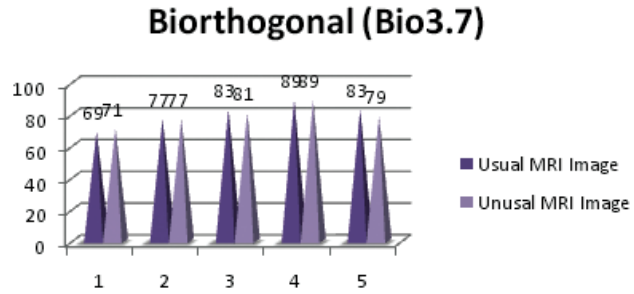

Figure 4: Biorthogonal (Bio3.7) for 1, 2, 3, 4, 5 DWT Decay Wavelengths

According to Figure 2 to 4 clarifications for 1, 2, 3, 4, 5 different DWT decay wavelength the proposed DWT with SVM classifiers estimates accuracy of energy features Db8, Sym8, and Bio3.7 respectively. DWT with SVM classifier is classified with different DWT decay wavelength utilized to identify usual and unusual pictures in MRI pictures. Three wavelet filters are investigated for MRI cerebrum picture classification. It classifies the MRI pictures into usual/unusual by SVM classifier which utilizes the energy features of db8, sym8, and bio3.7. Along with the filters, db8 offers better classification accuracy of 91% for usual and 96% for unusual picture categorization.

CONCLUSION

Prediction of brain image carried out by segmentation analyzing and detects the brain tumor from magnetic resonance image. The results depict that automatic detection of brain tumor can be done more from the MRI images in comparisons to other tumor detection systems available in the market. Further improvements also can be proposed with huge amount of MRI image data if available. Here, it used numbers of brain MRI images for our experiment; one such example is presented here in the paper to make the process and technique understandable. Three wavelet filters are investigated for MRI cerebrum picture classification. It categorizes the MRI cerebrum pictures into usual/unusual utilizes the energy features of db8, sym8, and bio3.7. The db8 offers enhanced classification accuracy of 91% for usual and 96% for unusual picture categorization.

Ethical Clearance: Presidency College

Source of Funding: Self

Conflict of Interest: Nil

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DOI Number: 10.5958/0976-5506.2018.00162.6

Clustering Techniques on Brain MRI

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ABSTRACT

In radiology Photostat of the human's anatomy and the corporeal parts on health and disease can be obtained by Magnetic resonance imaging technique. In the aspect of Brain, Segmentation is the technique in Magnetic Resonance Imaging, which is one of the effectual techniques, followed by many radiographers in discernment of any abnormality the brain attempts as well as the critical regions of the brain. These processes underpin with computerized and automated processing technique, so that analysis of the medical images made allay. The facet of segmentation technique is to obtain coherent analyze by obtaining the representation of images by pixels. The image segmentation using clustering technique helps in partition the different regions of the brain, white matter (WM), grey matter (GM), and cerebrospinal fluid spaces (CSF) into cluster or segments. These are the regions significant for physician and radiographers to detect, analyze and diagnose the abnormalities as well as the diseases. Adaptive Fuzzy K-means clustering algorithm proposes to differentiate those three regions, further the results are contrasted with that of fuzzy C-means clustering algorithm. The image segments from these outputs processes the solution in a qualitative approach proving that proposing method of algorithm is effectual for MRI brain images using segmentation techniques. This ensures accuracy. Based on Experimental evaluations, proposed algorithm reduces 0.721 ET (Execution Time) in seconds and enhances 2.03% SA (Segmentation Accuracy) of the proposed system compared than previous strategies.

Keywords: *Segmentation technique, Magnetic Resonance Imaging (MRI), white matter (WM), grey matter (GM), cerebrospinal fluid spaces (CSF), Adaptive Fuzzy K-means (AFKM), fuzzy C-means clustering.*

INTRODUCTION

Various medical image techniques mostly apprehend asymmetric results produced by Ultrasound (US) imaging, Computerized tomography (CT), and Magnetic Resonance Imaging (MRI). In that scenario, to make analyzes easier radiographer uses few tools for decision making and ensuring accuracy in corresponding image. In common the tumors, brain tissues and those anatomical structures are identified by radiologist by medical imaging, but there occurs some problems while performing MRI procedures. The problem here is that the image generated will have non-linear characteristics and at times corrupted with noise. These results are difficult for radiologist in identifying and locating the tumors, tissues as well as the study of anatomical abnormal growth of glands which leads the decision making process crucial. In digital image processing there are many segmentation methods have been introduced. At heart Segmentation is the process of splitting the observed image data into a serial of non-overlapping foremost corresponding regions. The analysis made for computer aided diagnosis and therapy for that of medical images precedes processing task in segmentation required the most, that uses computer aided image processing and image reconstruction. The approach of collocating objects into groups in which members are similar, here the goal is to find out structures or clusters available in a group of unstructured data. The general purpose of clustering algorithm is on development and advancements of medical imaging specialty. Few illustrations of medical images are photocopy of human's brain, bone, and other human body parts. Adaptive Fuzzy K-means (AFKM) is the clustering method in segmentation proposed for the purpose to segment the MRI brain images in the aspect of three important brain images. The AFKM classifies and partition the MRI brain imaging better compared to that of prior conventional techniques. The popular clustering algorithms such as KM, FCM, MKM having specified features. Those features are shared in AFKM clustering

method. Medical images can be used to capture the images of brain, bone, and other body parts. The AKFM usually helps to provide effective and resilient clustering techniques. AFKM proves its process is better than conventional method in the aspect of classifying and segmenting the MRI brain image. These featured AFKM clustering method is highly effective in segmenting the MRI brain image into three different critical regions.

RELATED WORK

Balafar et al.[1] discussed on segmentation of brain image as one of the clinical diagnostic tools for analyzing of critical parts of Human body especially brain. The Brain images usually produced with noise, in homogeneity and quite deviations. Thus obtaining an accurate segmentation of brain images is a tedious task. But diagnosing these segmentation images in an accurate way is important and crucial in analyzing. Aly A Farag et al. [2] described a computational complexity was reduced not by iterating in fine grid rather doing by a coarse grid containing the image. These generated errors in the result classification and detected sensitive in the portion of salt and pepper noise. To overcome the noise sensitivity and computational quirk of Pham and Prince Method, the paper presented a desperate approach for hazy segmentation of MRI data along with the presence of potency in homogeneities. Prastawa et al. [3] explicated the ground data undergo healthy classes usually gerates undesirable samples due to the mixture of samples with some other tissue types, notably tumor and edema. The morbid regions failed to detect rather viewed as a healthy regions. Caldairou et al. [4] discussed the contaminants presented as data outliers and removed to get the ground samples for the healthy classes without been affected. In general the samples told to have contamination when their habitual differ from established knowledge. Gopal et al. [5] investigated the PSO, a population- related stochastic optimization algorithm modeled. The samples were known to be contaminated if their characteristics differ from prior knowledge. Gordillo et al. [6] introduced the PSO which is a population-based stochastic optimization algorithm modeled subsequent to the simulation of bird flocks of social behavior and followed similar procedures as a relic algorithms generated a closer-optimal solutions. The work demonstrated the unalike composition available in the pattern matrix; the equivalent labels and that of posterior energy function values are marked and stored in the solution matrix. The solution matrix generated different columns for velocity, position and flag rates for each bird. The flag value obtained was used to specify whether the following kernel have been selected prior or not. Juang, L. H. et al. [7] developed the technique capable of solving the countered lesion types of objects are captured in MRI image generated by color-based segmentations of operations. The primary idea of generating color-converted algorithm with k- means provided solution by transfiguring the input gray-level type of image to a color spaced type of image then the image label are operated with cluster index. Chuang et al. [8] scrutinized the possibilities to inbuilt the approach of image-like MRI application. The exertion of this work method for uncovering tumor evinced to help pathologists discern the precise lesion size and that of regions. Kanade et al. [9] scrutinized the pixels from the image to be highly correlated, where the pixels in the immediate location which depicts quite similar featuring data. Thus the spatial combinations of nearby location pixels were one of critical feature aiding in imaging segmentation. Mathew et al. [10] elucidated the actual boundary identification techniques have been taken advantage of those spatial information in the process of image segmentation. However, the antiquated FCM algorithm doesn't utilized the spatial representation rather took advantageous of the existing classified information, and it was dynamically applied as part to those optimization procedures. Tailored the intent function of standardized FCM algorithm was consent to the immediate neighboring labels in the pixels to manipulate its labeling. Godara et al. [11] described capable alternatives that have lately emerged in various area of study to utilize the spectral methods for clustering. The utilization of top Eigen vectors in the matrix generated from that of distance between those points. These algorithms have effectively used in various applications which includes computer vision and VLSI designing and many more. In Litoriya et al. [12] discussed the pragmatic successes, several scholars still oppose in selecting the perfect eigenvectors for usage and determining the way to derive clusters from them. Also these algorithms intended to center its position on simplification of the algorithms which uses only one eigenvector at a particular time zone. Ali et al. [13] introduced two types of segmentation techniques which was detection methods and boundary detection methods. It determines the K means clustering technique was a pixel-oriented method which was one of simplest technique where found that

the complexity on particular regions of human anatomy. It also defined that k-means clustering well suiting for biomedical image segmentation where the number of clusters usually identified as particular regions of the human anatomy. Shah et al. [14] discussed a mix with prior study and the paper currently aimed for better results, In the process of segmentation, the pixels classified on diverse classes with several methods of uncertainty which mentioned by the function. Here the larger the obtained function value over the qualified pixel, the larger in the possibility of that cluster belonged pixel. Velmurugan et al. [15] propounded the primary things and that of qualities of approach have determined several limitations and benefits. Usually a data analytics way of clustering brain MRI image, but the paper attempted to utilize k-means algorithm with that of clustering brain images. The k-means clustering algorithm and Fuzzy C-means (FCM) clustering algorithm were subset of MRI image dataset. The main purpose of clustering detected the region of interest in the image. Currently, enormous methods utilized to the image enhancement, such methods like local enhancement, non linear enhancement, and historogram qualification, etc., the image enhancement generated with the purpose of to improve quality of the image.

PROPOSED SYSTEM

Based on the segmentation technique, a new method of clustering algorithm has recommended employing medical image like MRI. The proposed method stands distinct comparing to that of long-established conventional methods like Fuzzy C-means algorithm which was commonly used clustering algorithm. FCM cluster is engineered based on the similar facts from definition clusters by generating the results in iteration, location regulating and reducing the object function in that of images of brain MRI obtained from that of database. The images exercised with AFKM and FCM clustering algorithm and that of comparison is made between those clustering algorithms. For partitioning an image into clusters is made by iterating technique. The procedure of clustering method clusters randomly, manually and as well as based on some restrictive conditions. The Distances of pixels to that of cluster center is calculated by the squared or absolute. MRI been announced into the clinical medicine which is employed with the facets to detect the problems and those of calcifications in brain images. The upshots generated in MRI images of the soft tissue composition have improved to provide superior quality of pathological brain analysis and that of treatment. The major description and standard features of this approach is provided with that of limitations, benefits, leading to the work more effective. The primary aim is to ascertain and foresee the clustering performance by the pixel feature of the MRI brain images. The generated information is highly utilized for processing with Fuzzy C means algorithm to predict the pixel values in the images. Figure 1 and 2 depicts the normal and abnormal brain images.

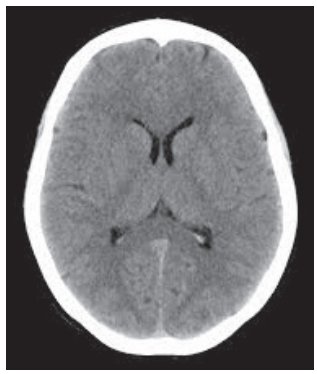

Figure 1: Normal Brain image

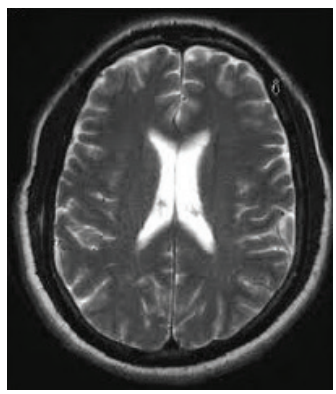

Figure 2: Abnormal Brain image

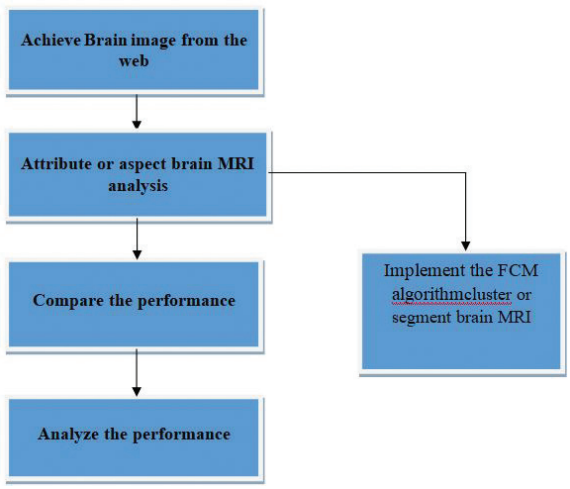

Figure 3: Process of brain clustering

The differences are highly identified on the factors of pixel, color, quality, location, and intensity, or the mixture of these obtained factors. The general identifiable clustering algorithms are K-means, Fuzzy, and exception maximizing algorithms. The K-means cluster data by technique of iteration to compute a mean intensity for each classes and segmenting those images by pixel classification with a closet mean.

Brain Image Analysis: The K- means technique pixel-based method capability, which is simplest among other techniques. Compared to other region-based or edge-based methods k-means is less complex. In addition K-means are highly recommended for biomedical image segmentation where the number of clusters determines the particular regions of the human anatomy. Reviewing the existing methods, found some problems, to overcome to see better results, it is useful to take soft segmentation techniques into the view. Where the soft segmentation pixels are generated by classification into different classes with several degrees of uncertainty those that are specified by functions. Higher the function value for a ground pixel, the higher that pixel is certain in belonging to that cluster.

Brain MRI Analysis: These techniques enable high-quality visualization of brain activity or the location of atrophies; moreover, these techniques facilitate the study of disease mechanisms in the healthy brain and might lead to the development of effective therapies or drugs against such diseases. However, raw MRI data must be statistically analyzed to obtain objective answers to clinical questions. Therefore, statistical methods play a very important role in brain research. Here, we briefly review the most commonly used statistical analyses, namely, data pre-processing, general linear model, random field theory, mixed effect model, independent component analysis, network analysis, and discriminate analysis. Further, we provide information about brain imaging data structure and introduce useful software to implement these methods.

Performance: Performance evaluation can also be termed as performance measurement, performance review, which determines how the system reacts to some specific requirement of the outputs in the experimentation of the hybrid Fuzzy segmentation technique, was discussed in this section. In a computer aided analysis, the processing and execution time is the most important attribute for any medical image analyzing. These results have obtained by calculating the number of pixels affected by tumor cells and those results are compared with that of conventional results. The propounded PSO along with fuzzy related segmentation technique generates effective values. The accuracy level of the brain tumor segmentation technique is also compared with conventional techniques. The percentile detection of tumor tissue cells is 98.87%.

Result and Discussion: The proposed method explores the performance metrics to minimizing an objective function in images of brain MRI is obtained from the database. It displays following evaluation parameters separately such as Execution time, Segmentation Accuracy. The metrics are used to evaluate the efficiency and accuracy of proposed methodology.

Execution Time (ET): Execution time (ET) is to execute one program from beginning time to ending time.

Segmentation Accuracy (SA): Segmentation accuracy is defined as the sum of the true predictions such as divided by the total number of predictions. True positives and true negatives are described as the number of images correctly estimated as positive and negative. False positives and false negatives are defined as the number of images incorrectly computed as positive and negative.

Experimental result: The tumor detection processing was identified from the pixel values from MRI brain images which are the inputs for the analysis. For performing qualitative analysis there it needs a human image for processing. Human image was elucidated based on capabilities and segmentation algorithm of existing method such as FCM and proposed method such as AFKM. The generated results of both normal and abnormal brain images of the given input are uprooted by such K-means algorithm with that of cluster considerations. The pixel representations in every figure can be said as similar image, the results of the proposed paper is splitting those two images by clusters.

Table 1 illustrates the Execution Time and Segmentation Accuracy for several input parameters with previous methodologies. The proposed methodology computed on various types of algorithms like K-means and Fuzzy C-means with closes existing methodologies. Based on tabular result observation, it can be said that the proposed methodology performs well compare than existing mechanisms.

Table 1: Comparison of ET (Execution Time) and SA (Segmentation Accuracy)

Methodology	ET	SA
K-means	3.643	82.33
Fuzzy C means	1.746	92.67
AFKM	1.025	95.7

The proposed system computed by following existing methodologies namely: K-means clustering and Fuzzy C-means mechanisms. According to Table 1, it noticed that AFKM has the best score on every particular factor.

Figure.2 demonstrates the execution time and the proposed algorithm AFKM is comparing with the existing algorithms such as K-means and Fuzzy C-means.

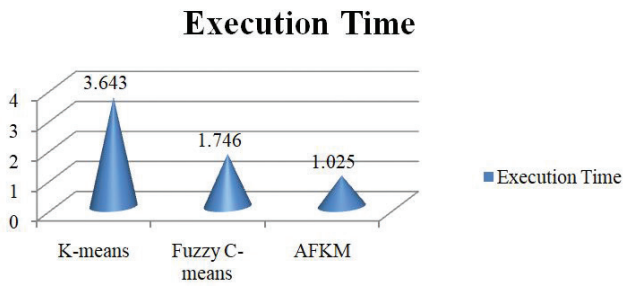

Figure 4: Execution Time of Brain Images

Figure.3 demonstrates the Segmentation Accuracy and the proposed algorithm AFKM is comparing with the existing algorithms such as K-means and Fuzzy C-means.

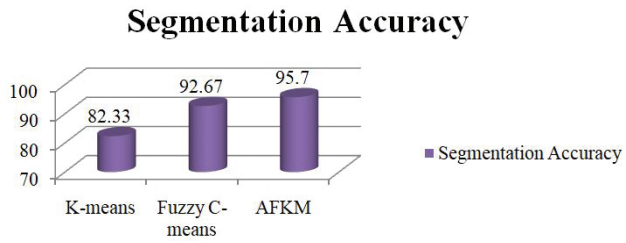

Figure 5: Segmentation Accuracy of Brain Images

According to Figure 4 and 5 observations, the proposed technique is estimated based on execution time and segmentation accuracy with existing classifier. Proposed AFKM is calculated with K-means and Fuzzy C-means methodologies behalf of on execution time and segmentation accuracy to evaluate the efficiency and accuracy of proposed technique. Fuzzy C-means is the closest competitor behalf of execution time and segmentation accuracy to proposed technique. Where, SL provides the accuracy in the scanned images. However, Fuzzy C-means takes more time to segment brain images, and it does not provide better result while the image was condensed. AFKM improved concurrently minimize the time to segmenting the brain images. It also enhances the accurateness of brain images, and it takes less time to predict MRI brain images. Proposed AFKM reduces 0.721 ET (Execution Time) in seconds and enhances 2.03% SA (Segmentation Accuracy). Finally, the paper claims the proposed AFKM methodology performs best on every evaluation matrix & respective input parameters.

CONCLUSION

AFKM is the inferred classification of MRI brain image which was made effective by fuzzy clustering algorithm. This process provides an effective method for segmentation from that of qualitative processing of MRI brain image. The Fuzzy clustering algorithms generated the results in sharper and clearer of the segmentation in MRI brain images. For future enhancements the algorithm could be made utilized in agriculture, engineering sectors. A simple clustering segmentation technique mainly depends on the initial set of clusters and quality of the segmentation is been decided. By using Pre-processing before the segmentation the performance of the segmentation can be improved. Pre-processing which eliminates the noise and those unwanted region leading to an optimum result. Proposed AFKM reduces 0.721 ET (Execution Time) in seconds and enhances 2.03% SA (Segmentation Accuracy).

Ethical Clearance: DG Vaishnav College

Source of Funding: Self

Conflict of Interest: Nil

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DOI Number: 10.5958/0976-5506.2018.00163.8

Determination of Business Intelligent Using Micro Financial Analysis of Tamilnadu SME

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ABSTRACT

Financial data processing is quite obvious where per mean time the collection of data is more for business intelligent using Information and Communication Technology. Most people in urban areas financially face problems which turns their day to day life into tragedy. Business intelligence tries to budget different kinds of plans, implementing to our beloved citizens for their comfort over state government. Even though, the prediction process fails in various manners while processing large amount of dataset ends with latency and cost consumption. To overcome financial data analysis among huge data feeds, big data hadoop is required for categorized result under various sectors. In the paper proposed a YARN (Yet Another Resource Negotiator) mechanism of hadoop framework to analyze micro small and medium enterprises data of Tamilnadu financial analysis. It implements hive tool to store data in Hadoop Distributed File System (HDFS), import analysis and produce result among them. Whereas hadoop/hive uses map and reduce to compute huge datasets, tables with structured data, CSV files, etc., each cluster perform multiple mapper and reducer jobs allocated for their categorized results, and the framework effectively accumulates as well as increase in performance via parallel processing with the help of multiple map reduce method. Based on Experimental estimations, proposed YARN framework enhances the less processing time 12 minutes, high Data Size 2 GB and accuracy 22.26% of the proposed framework contrasted than previous frameworks.

Keywords: *Financial management, Hadoop Distributed File System (HDFS), data analysis, hadoop framework, hive tool, Micro small and medium enterprises (MSMEs), MapReduce, performance and Tamilnadu government.*

INTRODUCTION

Micro small and medium enterprises (MSMEs) go about as a hatching ground for the improvement of entrepreneurial abilities and development. SMEs shape a vital and dynamic piece of the created economies and record for the greater part of all jobs and organizations in the created nations also. They assume an essential part in making the employments that huge organizations neglect to deliver in adequate amounts and furthermore challenge the monopolistic inclinations of the expansive associations. Notwithstanding, the early adopters of innovation in the SME showcase are little in number and changing over it to a bigger 'innovation acceptor' advertise is testing. A portion of the 'innovation acceptors' are hesitant to purchase another item notwithstanding when they can envision a business case for it predominantly because of the awful experience they had in the past with items that were bought at high costs and furthermore with restricted post-deals bolster. Then again, various they don't discover exceptional yield on speculation with the new innovation selection. Beating trust shortfall that has been made is the greatest hindrance to receiving ICT for operations. Development is the greatest impetus to development, regardless of whether the business is enormous or little and the utilization of ICT can trigger advancement by requiring items and procedures to be adjusted to the new innovation. SME markets that don't utilize ICT frequently free numerous open doors for encouraging development, According to Internet live stats.com access of web to more than forty percent populace of the world and access of portable correspondence to more than ninety percent populace of the world, are maybe the most grounded cases to see the reliance of general client on ICTs and consequently making them a fundamental piece of any enormous or private venture.

The developing rate of joblessness in Tamilnadu represents a test to people as well as to the Tamilnadu Governments. At the individual level, the foundation of business ventures especially SMEs has been depends on beneficial work. A few issues have introduced constraints to the vast majority of the Tamilnadu business people so much with the end goal that not exclusively is the development of their endeavors influenced yet survival debilitated. Among these various impediments are the issues of promptly access to capital, absence of administrative discernment, poor or nonappearance of infrastructural offices particularly energy to help smooth, compelling and effective operations. While the wage gathering to the business visionaries and the development of their organizations is influenced, a comparative impact is applied on the economy overall. The development and advancement of the nation is moderated. Around 90 percent of the general population in developing nations needs access to money related administrations from foundations, either for credit or investment funds. In the event that the general population in developing nations have a constrained ability to put resources into capital, profitability is confined, wages are repressed, household reserve funds stay low, and once more, any expansion in efficiency is counteracted. Following sections will discuss detail about proposed framework, result and discussion of our proposed scheme and concluding in the article from categorized result.

RELATED WORK

Taylor[1] discussed the vigorous, blame tolerant Hadoop Distributed File System (HDFS), propelled by Google's record framework, and in addition a Java-based API that permits parallel handling over the hubs of the group utilizing the Map Reduce worldview. Rodger [2] illustrated the logical help to work force to get to and control information inside the three ship databases. Erwin et al. [3] suggested favorable position, for example, ordering for Hive with a quicker perusing record since it doesn't need to peruse the whole document. Chen et al. [4] designed a Network investigation and beginning examination territory that has developed from the before reference based bi-bliometric investigation to incorporate new computational models for online group and informal organization examination. Lim et al. [5] surveyed the coordinated effort model of scientists have guide access to genuine datasets and create both elucidating and prescient models about client inclinations and conduct. Davis et al. [6] discussed the advantages of customary RDBMS database frameworks and those of cutting edge NoSQL database frameworks, which propose speaking to and overseeing information through level information segments by revoking, settled table mappings and, significantly, asset costly join operations. Yuen et al. [7] designed the best quartile for accomplishment of business benefits, for both subjective variables and the hard advantages of information adaptation, enhanced client benefit and diminished IT costs. Wouw et al. [8] illustrated the capacity of an inquiry motor proficiently utilized the framework assets accessible. It is vital, in light of the fact that particularly SMEs can't stand to squander valuable framework assets.

Moalla et al. [9] discussed the venture can pull in some of its clients in view of past deals record in two measurements; client insightful and item shrewd elucidation with the additional parameters of the endeavor ability to deliver those targetable items on calculable minor benefits. Dugan et al. [10] performed nearby tests previously sending the contents on EC2 discovers code blunders and oversees in decreasing the expenses of fizzled groups on EC2. Ahmed & Jolly [11] discussed the performance improvements scale linearly, which means that as you add more nodes and processing power, the performance of your in-database data quality programs continues to improve. Sewak, M., & Singh, S [12] audited hadoop cluster used to store historical data archived from different data stores for analysis and analytics required historical data or utilizing lambda architecture. Kalan, R. S., & Kocabas [13] suggested a big data analytical under the umbrella of the MapReduce model requires great programming skills and huge resource investment. Cuzzocrea et al. [14] presented a devise models, techniques and algorithms was able to ensure the provenance and the trustiness of big enterprise data. Nimje [15] evaluated the DAaaS can be deployed in the cloud depending on various service types, depending upon the user needs and resource availability such as public or private cloud environment.

PROPOSED SYSTEM

The proposed YARN framework implements hadoop cluster to process financial data analysis with huge amount of datasets with the help of hive warehouse. Hive warehouse internal architecture co-existed with map reduce jobs, dataset is exported to HDFS (Hadoop Distributed File System). Then, hive creates an external

table to import structured dataset. By creating external table, the data availability is improvised whereas dropping the table will not delete the records but it will drop the table structure. Figure.1 demonstrates the architecture diagram of hadoop and hive financial analysis framework.

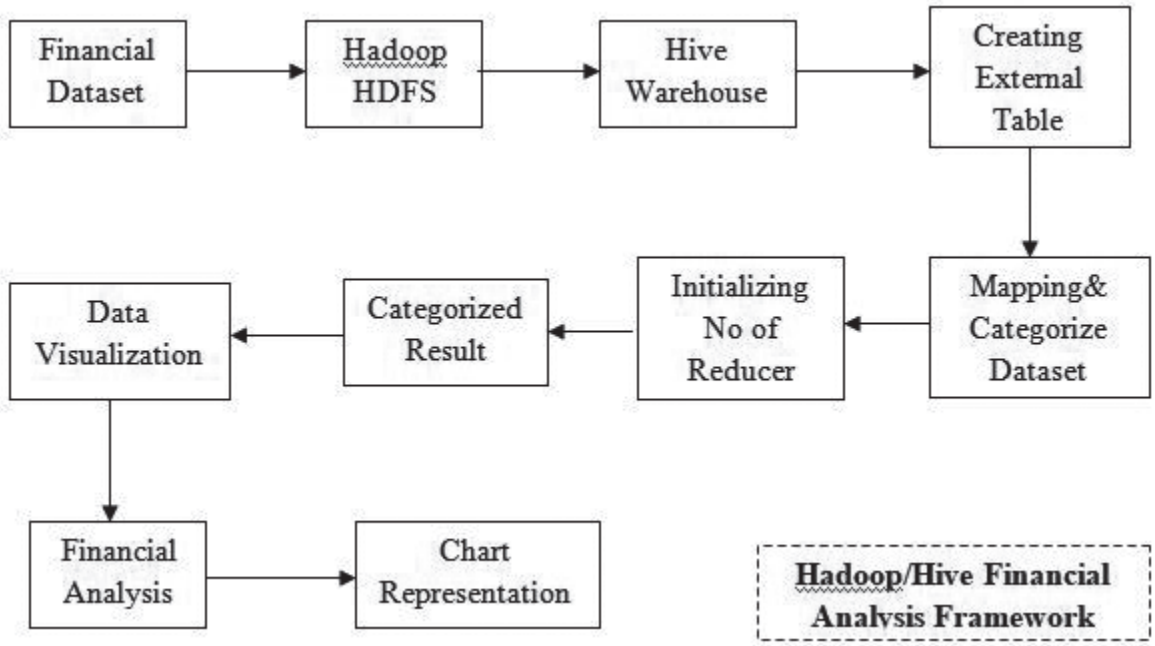

Figure 1: Architecture Diagram of Hadoop and Hive Financial Analysis Framework

Hadoop HDFS: Hadoop HDFS is a special type of computational storage file system designed specifically for storing and analyzing large quantity of structured, semi-structured and unstructured information in a distributed computing environment. The Hadoop HDFS works to share dataset and imported in hive warehouse for share data set prediction. The approach provides lowers the risk of system failure and no data loss, even if a significant number of nodes become inoperative.

Hive Warehouse: Hive is an open-source data warehouse framework for querying and analyzing huge size of datasets stored in Hadoop files. It helps queries conveyed in language called HiveQL, which automatically interprets SQL-like queries into YARN operation executed on Hadoop. Enables data serialization/deserialization and improves flexibility in schema design by containing a framework catalog called Hive-Meta-store.

Data Visualization: Data visualization has been significant in democratizing data and analytics and creating data-driven insights accessible throughout the data warehouse. Share prediction application typically easier to operate than conventional statistical analysis and led to a rise in lines of business implementing data visualization tools. The shared data from datasets has been imported to hive warehouse, later the share prediction application is utilized to visualize imported data and run analysis for further procedures.

Financial Analysis: Financial source connects via YARN API to the financial fire-hose, and continuously downloads micro small and medium enterprises data of Tamilnadu financial data. These data are translated into JSON format and are sent to the reducers, HDFS sink in our use case. For Connecting with financial MSMEs data and require access tokens and secrets of a financial MSMEs data account. As the time intervals provided in the conf file are in terms of minutes, wait some times to get good amount of data analysis into output HDFS files.

Result and Discussion: The SME financial data set is utilized and it collected from Tamilnadu state government based on business domain. The specialist utilized both subjective and quantitative techniques for investigation. The information was additionally composed and quantitative information examined through utilization of pie-diagrams, tables and structured presentations. Spreadsheet programming was utilized.

The proposed YARN strategy computes the evaluation parameters such as processing time, and

accuracy based on data size and it calculate efficiency of the proposed YARN strategy and overcome the previous strategies in huge data sets. In the framework analyze micro small and medium enterprises data of Tamilnadu financial analysis.

Table 1 demonstrates the processing time and accuracy based on data size for input parameters with previous hadoop frameworks. Table 1 demonstrates the average value of all evaluation constraints with input parameter. The proposed YARN framework is calculated with following previous frameworks namely Axiomatic Framework (AF), MapReduce (MR) frameworks. According to Table 1, it noticed that YARN framework has the best score on every particular parameter for frameworks.

Table 1: Comparison of Data Size, Processing Time and Accuracy

Algorithms	Data Size (GB)	Processing Time (min)	Accuracy (%)
AF	9	40	60.69
MR	9	33	73.89
YARN	11	21	92.73

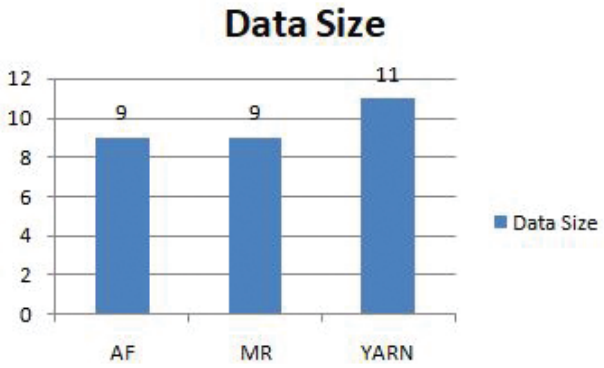

Figure 2: Comparison of Data Size (DS)

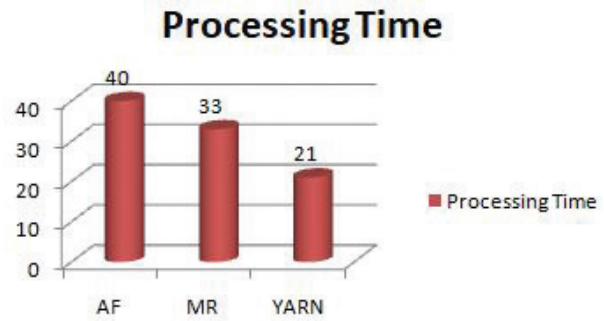

Figure 3: Comparison of Processing Time

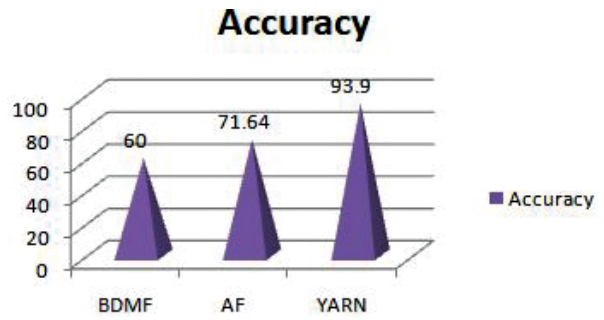

Figure 4: Comparison of Accuracy

Along with Figure 2 to 4 evaluations, it observed the proposed YARN framework is computed based on data size, processing time and accuracy. Proposed YARN framework is calculated with Axiomatic Framework (AF) and MapReduce (MR) frameworks behalf of data size, processing time and accuracy. AF is the closest challenger. It enhances the classification of huge data base. However, AF is offered with the less accuracy. A YARN framework analyzed micro small and medium enterprises data of Tamilnadu financial analysis with high data size and provides less processing time 12 minutes, high Data Size 2 GB and improves accuracy 22.26%. Finally, the paper announces the proposed YARN framework is best on all several parameters.

CONCLUSION

The YARN framework works on parallel processing which reduces the amount of time taken to process huge size of datasets through cluster nodes. Hive warehouse improvises structured data analysis as well as CSV format data, the hive runs map and reduce part inside for producing categorized result for business perspective. SME dataset collected from Tamilnadu state government based on business domain is computed using proposed framework generates analyst perspective result to further helps financial sector to allocate resource on needed area with predicted analysis. A YARN framework analyzed to provide less processing time 12 minutes, high Data Size 2 GB and improves accuracy 22.26%. Finally, the paper announces the proposed YARN framework is best on all several parameters.

Ethical Clearance: Presidency College

Source of Funding: Self

Conflict of Interest: Nil

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DOI Number: 10.5958/0976-5506.2018.00164.X

An Adaptive Self Reconfiguration Mechanism for Improving Reliability in WSN

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ABSTRACT

In wireless sensor networks, continuous link failures among nodes caused owing to energy drain, environmental conditions, interference, obstacles, etc. The routing protocols, for the WSN, must have self-configuration characteristic goals for finding the best path to transfer the data from source to destination. It is not need to create new routing if any link failure occurs in the network. In this paper we propose An Adaptive Self Reconfiguration Mechanism for improving Reliability (ASMIR) to reduce the link failure and improve the energy efficiency in the network. The simulation result shows that the ASMIR improves the network performance.

Keywords: *Self-re configuration, Energy Efficiency, Link Failure Recovery, Wireless Sensor Network.*

INTRODUCTION

A Wireless Sensor network contains large number of nodes and every node has one or more sensors. In WSN, sensor nodes that cooperate with each other to collect the data from the surroundings such as wind, temperature, water level, smoke, sound, humidity, etc. The Wireless Sensor Networks has more applications for example healthcare, battlefield, environmental, industrial purpose, traffic monitoring, and power plant, etc. Sensor nodes gathering data from environment and send the collected date to base station via wireless channel.

Directed Diffusion routing protocol[1] was used to reduce the energy consumption in the network. A self-adaptive clustering algorithm was used for increasing Energy-efficiency and Scalability in Wireless Sensor Networks. The self-adapting algorithm[2] optimize the sleep times of the nodes in the cluster by adapting to varying traffic loads. This method produce a reliable and robust sensing network, that promises more energy saving, scalability, and increased lifetime for the WSN. Intelligent Energy-Saving System Designed technology[3] was used to save energy in WSN. Adaptive synchronization mechanism[4] is used to improve the energy saving in WSN. An ant colony optimization[5] is used to reduce the path delay, energy utilization and increase the network lifetime. Self-managing fault management fault detection and recovery method[6] improves the network lifetime. Fault tolerance technique[7] detects the sensor fault by binary output of the sensors. In this scheme every sensor node monitors the binary output of its sensor and also compare with the pre-defined fault model. Distributed Fault Detection and recovery mechanism[8] is used to reduce the energy exhaustion. In this strategy, the cluster contains four types of nodes such as cluster head, internal node, boundary node and pre-boundary node. In this scheme, the boundary nodes do not need any recovery but other three type nodes have to take suitable actions to attach the cluster. Adaptive Connectivity Restoration mechanism[9] was used to address the problem of single and multiple node failure with cooperative communication. Collaborative Connectivity Restoration Algorithm is used in cooperative communication and node maneuverability to restore network connectivity after multiple nodes fail. These two algorithms minimize the energy debauchery. Extended fully distributed cluster-based routing algorithm (EFDCB)[10]] for the link failure issues in the WSNs. In this paper, first find out the faulty nodes or nodes that are more prone to failure in the network and excluding them in the path selection process then there is positive effect on node energy by reducing the communication overhead.

PROPOSED METHOD

In a WSN, the source transmits the data to destination failed owing to the topology changes, weak link strength, battery drain, breakdown of the communication in the wireless node hence link failure occurs. This paper focuses the major difficulty of link failure because of the sensor energy drain in the WSN. The goal of this paper is to improve the quality of service in the network. In WSN, generally two types of fault management can occur such as permanent and potential. The permanent fault represents the node completely disconnects from the other node or network like a hardware failure. The potential fault represents the link breakage due to node energy, received signal strength, obstacle, interference etc. While, the node energy is below threshold, it will send to the sleep mode before it. In this paper we propose An Adaptive Self Reconfiguration Mechanism for improving Reliability in WSN. When the battery is depleted, a node is useless and cannot share in sensing or data dissemination. Potential failure can be detected and treated before it causes the sudden death of a node e.g. sensor node with low residual energy can be send to sleep mode before it completely off the working process. Figure.1 shows the architecture of the ASMIR scheme.

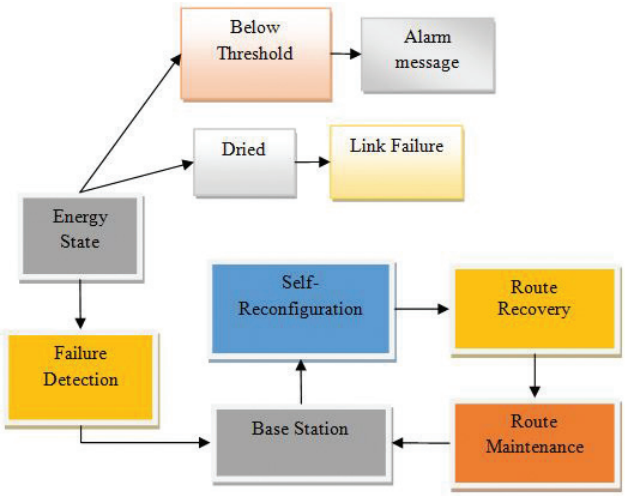

Figure 1: Architecture of the ASMIR scheme

Here, every sensor node monitors the neighbor node energy. Here, the sensor node energy level is reduced below threshold, it will send the alarm message to the neighbor nodes and it send to the sleep mode. When, the near node get the alarm message then it sent to the BS. At a time does not need to proceeds the recovery process.

If suppose, the node energy is suddenly decreased, it will completely off and cannot share the alarm message. While, energy drains near neighbor node (known as updated node) send the information update to the BS then the BS ask the query of failure node. This query consists of node ID, node location, energy level. The updated node does not immediately response to the BS queries, the BS decides the message is wrong and the updated node is faulty and sends the notification message to the all nodes. Otherwise, the BS starts the recovery process. The BS checks the updated node energy level, if the energy level is high the updated node share the energy to dried node. Otherwise, the updated near node share the energy. Finally, the dried node transmits the data from source to destination in the WSN. Hence the performance of the network is improved.

Simulation Result: The performance of ASMIR is analyzed by using the Network Simulator version-2 (NS2). The parameters used for the simulation of ASMIR are shown in Table 1.The simulation of the proposed ASMIR has 50 nodes deployed in the topology area 1000 × 1000m.

Table 1: Simulation Parameter of ASMIR scheme

Parameter	Value
Channel Type	Wireless Channel
Simulation Time	50 s
Number of nodes	50
MAC type	802.11
Traffic model	CBR
Topology Area	1000×1000
Communication range	250m
Network interface Type	WirelessPhy

Packet Delivery: Ratio between packet sent to the destination and packet received by the destination is considered as Packet Delivery Rate (PDR). The PDR calculation is done by using equation (1)

$$PDR = \frac{\text{Total Packets Received}}{\text{Total Packets Sent}} \quad \ldots(1)$$

The figure 2 shows that the PDR of proposed ASMIR scheme gives better result compared to the existing EFDCB scheme.

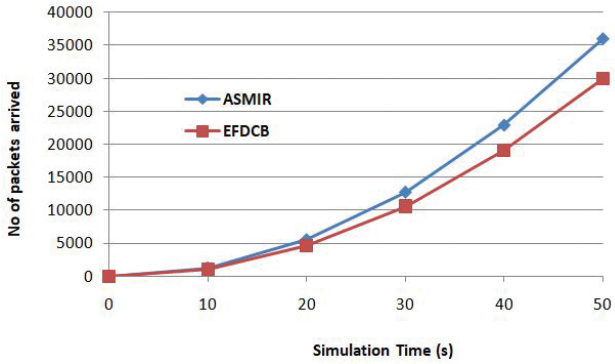

Figure 2 Packet delivery rate of ASMIR and EFDCB

Packet loss: The Packet Loss Rate (PLR) is the ratio of total amount of packet dropped by the receiver to the total amount of packet sent to the receiver. The PLR is calculated using equation (2)

$$PLR = \frac{\text{Total Packets Dropped}}{\text{Total Packets Send}} \quad \ldots(2)$$

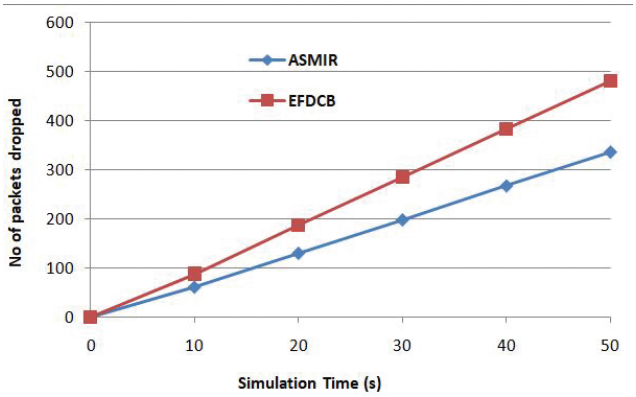

Figure 3: Packet Loss Rate of ASMIR and EFDCB

The PLR for the proposed and existing scheme is shown in the figure 3. The loss rate is lesser for the proposed scheme ASMIR compared to the existing scheme EFDCB.

Throughput: Throughput is defined as overall network performance or the total amount of successfully delivered packets in a given period of time. Throughput can be calculated by using equation (3)

$$\text{Throughput} = \text{Pkts Rerceived (n)} * \text{Pkt Size} * 100 \quad \ldots(3)$$

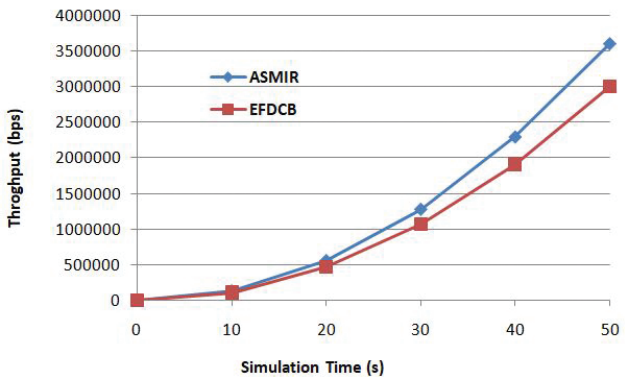

Figure 4: Throughput of ASMIR and EFDCB

The figure 4 shows the throughput analysis for the EFDCB and the ASMIR scheme. The ASMIR scheme has better throughput.

Delay: The time difference between the current packet received and the previous packet received is defined as the average delay of the network. The equation (4) is used to calculate delay.

$$\text{Delay} = \text{Current pkt rcvd Time} - \text{Prev pkt rcd time} \quad \ldots(4)$$

The performance analysis of delay for the both ASMIR and EFDCB is shown in the figure 5. The proposed system has lower delay compared to the existing one.

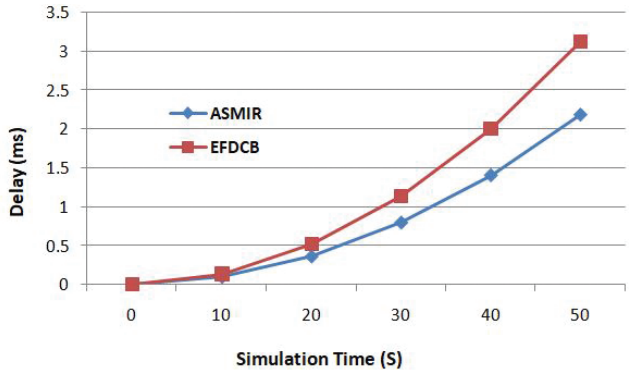

Figure 5: Delay of ASMIR and EFDCB

Residual Energy: The remaining energy present in the node after the transmission of data is defined as residual energy. The proposed system consumes less energy for sensing and data transmission. The figure 6 shows the

residual energy for both proposed and existing schemes. In this figure, the ASMIR has highest remaining energy compared to the EFDCB scheme.

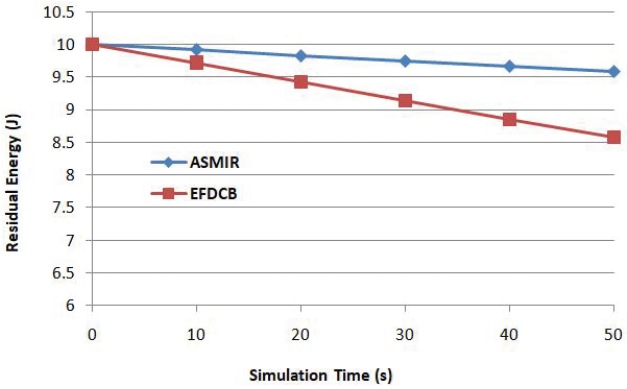

Figure 6: Residual Energy of ASMIR and EFDCB

CONCLUSION

The occurrence of frequent link failures between the nodes is prevented by using self-reconfiguration technique in the network. It is not need to create new routing if any link failure occurs in the network. An Adaptive Self Reconfiguration Mechanism for improving Reliability is used to recover the nodes from frequent link failures due to drained energy and improves the performance of the network. The performance analysis is done for the proposed ASMIR method shows that the system have good throughput as well as reduces the energy consumption and improve the network performance.

Ethical Clearance: Taken from St. Peter's University.

Source of Funding: Self

Conflict of Interest: NA

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DOI Number: 10.5958/0976-5506.2018.00165.1

To Improve the E-learning System using Data Mining Technique with Internet of Thing Exposure

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ABSTRACT

Nowadays, E-learning resources are developed by academician (institution) and industrialist (industry) side. There are many techniques is implemented to expose the E-learning for remote area people who are unable to adapt formal education system. However, current system is still suffering from content visualization, subject wise content classification and evaluation issues. To propose an E-Learning Content Retrieval & Visualization (ECRV) technique and it enhances the nature of materials and conveyance techniques. The method enforce to e-learning service provider for potential utilization of Internet of Things (IoT) to gather information, which will be broke down to get data helpful for basic leadership to enhance the online content visualization for rural people and as well institution. The technique offers a proposition of a framework where information gathered from the IoT gadgets, it will be utilized to enable the instructive establishment's management to settle on educated choices. The method enhances strategies and suggestions for better arranging, checking, assessment, cost effectiveness, and along these lines enhancing nature of the learner. Based on experiment evaluation, proposed techniques improves the content visualization accuracy and content retrieval time compare than existing methods.

Keywords: *Internet of Things (IoT), E-learning, content visualization, content retrieval time Data Mining technique, online Training, E-Learning Content Retrieval & Visualization (ECRV) technique.*

INTRODUCTION

Many Individuals utilize internet for various purposes specifically to get information regarding education as well as subject knowledge to make they aware and update periodically. The individuals who are propelling their vocations and understudies will make utilize of the web for instructions related to employment process like applying for a private as well as government jobs, and keep track of the status, searching and referencing the appropriate online materials etc., Because of the expansion in number of clients enrolling for the online courses a nearby checking and assessment by the foundations is turning into at wearisome task [1]. The quantity of chiefs/guides doesn't provide sufficiency with this expansion, hence the instructive foundations are putting colossal sum in internet educating and learning, keeping in mind the end goal to take the benefit of the system as a stage. The Internet offers high transmission capacity reasonable for applications, for example, movements, video conferencing, and reenactments to an overall group of onlookers of interconnected students. The stage is giving a situation to sharing of substance with each other and online course modules [2]. IoT instruments are being utilized to gather information as the students are cooperating with the web based learning stages, for example, Massive Open Online Course's (MOOCS) and send it to a focal database framework for examination.

The point of this examination is to investigate whether Internet of Things (IoT) can be utilized to enhance web based learning and internet education. This paper gives a proposition of a framework where information gathered from the IoT gadgets will be utilized to enable the instructive establishment's management to settle on educated choices. A few data mining calculations will be connected inside the focal database frameworks to sort, organize, consolidate and investigate data to create reports for different levels of management.

The continuous stream of information and examination of these exchanges can be encouraged straightforwardly to a learning investigation framework

for information driven basic leadership by the higher learning establishments. The online gets the scholastic stages are additionally influencing the organization of the colleges and universities[3].

Related Works: The adaption of new advances for learning has flourished in the rising of universe of the Internet of Everything (IoE) "the organized association of individuals, process, information, and things" which is turning into the reason for the Internet of Learning Things [4], [5]. A few looks into have been conveyed in the field of E-Learning on the most proficient method to enhance the student's execution scholastically and to maintain the establishments notoriety on instruction. In the UK, eight schools took parted to discover how Internet of Things can improve learning in science, innovation, and Geography in a plan worth $1.2M[6].

Various e-learning stages are accessible in today's moment and most famous stages are the business frameworks Blackboard, Clix, and Desire2Learn, and the open-source stages ILIAS, Moodle, OLAT, and Sakai [7]. With present day change of innovation many learning organizations are applying the Internet of Things (IoT) inside their web based learning stages to gather, store and send the information to the focal database framework. The information gathered is more mind boggling and testing because of increment in the volume of information collected [8], [9].

IoT driven the business change through looking for circumstance with regards to item is utilized in the item as well as in accomplishing transformative results through armada use not specifically through cutting edge IoT usefulness [10]. IoT enabled ventures to make an incentive in the environment through taking the benefit of the accessible open doors. It additionally given the enterprises better comprehension of the IoT scene through various ways with the goal that esteem can be made and caught [11].

Proposed System: The proposed E-Learning Content Retrieval & Visualization (ECRV) technique will be created utilizing object programming dialect Java and examination motor (Hadoop). The design has four modules as appeared in fig 1 (i) Sensors gadgets and information focus (ii) Questionnaire (iii) Data examination (iv) Data representation. The application will apply distinctive calculations to give diverse reports for the administration.

Sensor Data Collection and transmission: The heterogeneous sensors will be utilized to gather information, store and transmit to the unified database. At this stage a unique care ought to be mulled over keeping in mind the end goal to gather precise information that incorporates its chance stamp. Likewise vitality productivity, adaptability and adaptation to non-critical failure of the sensors as this will permit the administration and dissemination of the assets over the entire system structure. For instance receiving the information conglomeration will diminish the measure of information transmission and in this manner advancing the use of vitality of sensor hubs.

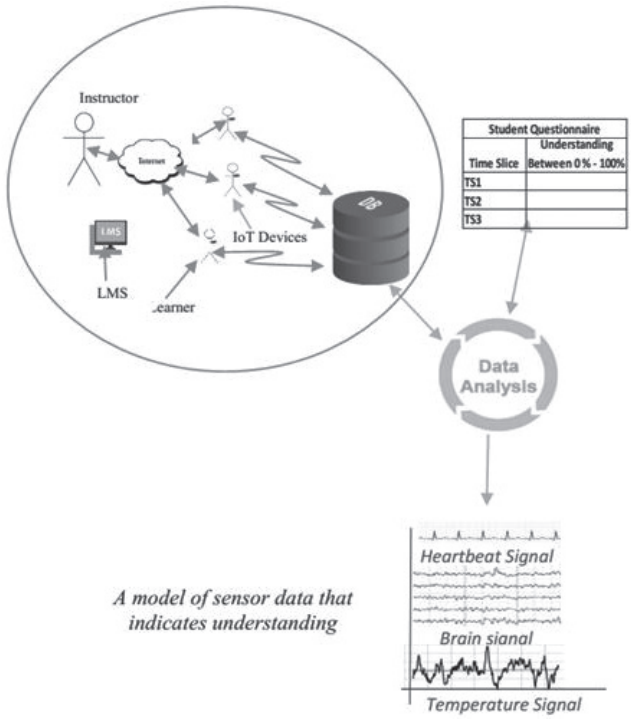

Fig. 1: IoT Proposed System Framework

Data Concentration Center: The heterogeneous sensors will catch and store enormous information before transmitting it. In this way, it is important to consider how to oversee information gathered successfully and how to execute a calculation that will have the capacity to dissect and process information advantageously. The information has the accompanying attributes: (i) Data of brilliant articles has a tendency to have its own particular certain semantics (ii) Data of keen items is probably going to mistaken, and generally is time-related or area related (iii) In the earth of IoT, gadgets, for example, sensors and RFID will deliver gigantic information streams. The qualities of IoT information set forward new requests for information administration and information mining that incorporates:-

1. Identification and tending to of shrewd items–as they will be extensive number of savvy gadgets associated and needs distinguishing proof and tending to viably. This will empower to question or speak with the shrewd articles.
2. Time-arrangement level and occasion level information total
3. Data deliberation and pressure for sifting excess information.
4. Privacy and security issue in information administration of IoT
5. Data file, list, versatility and get to control for IoT information.
6. Data stockroom and its inquiry dialect for multidimensional investigation.
7. Interoperability and semantic comprehensibility for heterogeneous information of IoT.

Cloud Processing, Analytics and Visualization: Information examination and perception is central to learning foundations to comprehend the concealed information design in information that can prompt enhanced strategies and suggestions for better arranging, checking, assessment, cost effectiveness, and along these lines enhancing nature of the students. In such manner, we will make a calculation that will have the capacity to do information preparing, break down and picture for the administration. All the three levels will be interlinked to permit correspondence and stream of information as appeared in the fig. 1. The advantages that the clients will pick up from utilizing the perception apparatuses are enhanced basic leadership, enhanced coordinated effort/ data sharing, Better impromptu information examination and efficient.

The consequence of the model of sensor information will illuminate the comprehension of the understudies. In the event that the rates of the lion's share clients demonstrate the low comprehension of the substance, educator is educated to change amid the break sessions.

RESULT AND DISCUSSION

Experimental Setup: The proposed method is implemented in JAVA programming environment using JDK(Java Development Kit) NetBeans 8.0 with Weka library with cancer disease symptoms datasets. The experimental setup uses a system with Intel Dual Core processor (1.836 Hz), 2GB memory under Window 7 Ultimate system. The proposed method retrieves various types of query given by the user and collects the information based on the respective dataset types

Performance measures: The performance of the proposed disease identification system using E-Learning Content Retrieval & Visualization (ECRV) is measured by accuracy, precision, recall, F1 score and Information retrieval time. The proposed technique is intergraded with Support Vector Machine (SVM) classifier. The performance evaluation of proposed methods is defined below.

Classification Accuracy: In data mining, the most common evaluation method is classification accuracy. The classifier performance is better if it has higher classification accuracy. It is defined by

$$\text{Accuracy (\%)} = \frac{\text{Total number of correctly classified instances}}{\text{Total number of instances}} \times 100$$

Precision and Recall: These measures are derived from the confusion matrix obtained. Precision is the fraction of correctly retrieved instances which are relevant to the given query. The fraction of retrieved relevant instances is called as recall. They are defined by

$$\text{Precision} = \frac{TP}{TP + FP}$$

$$\text{Recall} = \frac{TP}{TP + FN}$$

F1 Score: F1 score is the harmonic mean of precision and recall. It is also called as balanced F score. It is defined by

$$\text{F1 score} = 2 \times \frac{\text{Precission} \times \text{Recall}}{\text{Precission} + \text{Recall}}$$

System Execution Time (SET): In this section, proposed method describes mathematical model for query retrieval time in equation (3). In this step, proposed method is calculates as processing times with respect of user query. Here system execution time (SET) is calculated as:

$$SET = T_{CD} \times T_{AR} \quad \ldots(3)$$

Where T_{CD} is total number of candidate dataset and T_{AR} is average retrieval time for dataset.

Table 1 display the Accuracy and System Execution Time(SET**)** for learning Dataset for Internet of Thing(IOT) exposure with existing approaches namely as NB(Naive Byes), KNN(K-Nearest Neighbor), LDA(Latent Determinant Analysis) with proposed ECRV+SVM.

Table: 1 Accuracy and System Execution Time(SET) for E-learning Dataset

Learning Algorithm	Dataset 1[12]		Datset 2[13]		Dataset 3[14]	
	Accuracy	SET	Accuracy	SET	Accuracy	SET
NB	77.04	0.52	70.09	0.92	52.72	0.91
KNN	98.94	0.46	86.88	0.75	78.67	0.71
LDA	81.85	0.98	71.53	0.91	66.4	0.87
ECRV + SVM	99.52	0.35	87.10	0.37	98.49	0.36

Along with table.1 clarifications, it observed that the proposed ECRV+SVM technique is calculated depends on Accuracy and System Execution Time (SET). Proposed ECRV+SVM are computed with NB (Naive Byes), KNN (K-Nearest Neighbor), LDA (Latent Determinant Analysis) classifiers behalf of Accuracy and System Execution Time (SET). KNN is the nearest challenger. It enhances the e-learning. However, KNN is provided with the less accurateness. An ECRV+SVM technique improves the e-learning analysis accuracy 6.87% and system execution time 0.28. Finally, the paper announces the proposed ECRV+SVM technique is best on all several parameters.

CONCLUSION

The goal of utilizing the IoT is to provide facilities of obtaining, storing and processing the information sets that associated with the databases. The information is been investigated and the capacity ranges are said to increase for enhancing the long time learning process in Internet. With rapid emergence of innovations, the biggest learning foundations are facing many challenges and stood capable to many difficulties, for instance, conveyance techniques, nature of substance, instructor's learning initiative, academic hypothesis, instructive innovation administration, instructive structures and belief system. An ECRV+SVM technique enhances the e-learning analysis accuracy 6.87% and system execution time 0.28. Lastly, the paper declares the proposed ECRV+SVM technique is best on all several parameters.

Ethical Clearance: Mahendra Engineering College

Source of Funding: Self

Conflict of Interest: Nil

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DOI Number: 10.5958/0976-5506.2018.00166.3

Design and Analysis of Dust Conditioner

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ABSTRACT

The Screw transports are generally utilized for transporting mass material than different transports. They can be utilized for metering (measuring the stream rate) application in coal businesses from capacity storehouse to tidy conditioner as opposed to utilizing conventional revolving valve. The greater part of these investigations was test in nature. Here in this paper we speak to the adjustment of clean conditioner by supplanting its metering gear at channel that is revolving valve by tighten transport the same compelled space to get same yield of 15 tons from changed outline with diminished support and less power utilization, by manufacturing and field trial we have discovered that the plan is protected. This dialog will be useful for future research and modern utilize.

Keywords: *Screw Conveyor, Tidy Molding, Dust Conditioner, Rotary sealed Area Valve (RAV) and Cyclone Melting System (CMS)*

INTRODUCTION

In kettle when coal is filled, it is signed with fuel and changed over into two structures fly fiery debris particles and bed powder. Bed fiery debris is by and large at high temperature, this bed powder is dunked into icy water so its temperature is diminished and afterward it is passed on by submerged belt transport to storehouse. The potential of additives to remove trace metal air toxic emissions from coal combustion in conventional particulate control devices[1].

Only bubbling fluid bed and circulating fluid bed designs were reviewed for this report. Fixed bed and high temperature slagging gasifiers were not reviewed at this time [2]. The fly fiery remains is blended with steam and it is suck by constrained draft fan to fireplace, so before fly powder is gone through turbine creating power it is gathered by electrostatic smoke precipitator, subsequently a large portion of fly cinder is gathered by electrostatic smoke precipitator and passed on by belt transport to storehouse. At that point both of these fly fiery debris particles and bed slag are gathered together in storehouse. At the point when storehouse is filled its valve is opened and both fly powder and bed cinder stacked to trucks. The principal objective of the program is to demonstrate the ability of a Vortec Cyclone Melting System (CMS) to remediate DOE contaminated soils and other waste forms containing TM RCRA hazardous materials, low levels of radionuclides and TSCA (PCB) containing wastes. The program demonstrated in [3] verified the ability of this vitrification process to produce a chemically stable glass final waste form which passes both TCLP and PCT quality control requirements, while meeting all federal and state emission control regulations. Prior to this cinder is stacked in truck, to abstain from dissipating of fly fiery debris into climate which prompt ecological contamination it is blended with water so it is changed over to granular frame and fly powder is not ready to disperse in air. This procedure is called tidy molding.

The present global effort to curb GHG emissions involve substituting fossil fuels with renewable fuels and improving efficiency of energy utilization, and plans to separate and sequester CO_2 [4]. At that point this type of slag is stacked into the trucks, here both fly fiery remains and bed cinder gathered in storehouse and indicated amount of powder is exchanged to cinder/ clean conditioner through rotating valve however issue with this revolving valve is that because of any irregular size of bed powder clinkers ordinarily it happens that little size clinkers stalls out amongst stator and rotor hole, additionally some of the time huge size clinker

stalls out between outlet of storehouse and bay of rotational valve and incessant upkeep of turning valve is required. The modification of dust conditioner by replacing its metering equipment at inlet is represented in [5] that is rotary valve by screw conveyor in the same constrained space to get same output of 15 tons from modified design with reduced maintenance and less power consumption; by fabricating and field trial we have found that the design is safe. So as opposed to utilizing turning valve we can utilize tighten transport the same obliged space so we needn't bother with this continuous support. Applications of marine robotic vehicles and Investigation of underwater acoustic networking enabling the cooperative operation of multiple heterogeneous vehicles are explained in [6, 7]. In particular, a USV integrated underwater acoustic modem becomes an optional creative node in an underwater acoustic network, because it has some advantages, such as easy integration, quick positioning and low cost. Dynamic positioning of beacon vehicles is discussed for cooperative underwater navigation [8]. The Figure 1 explains the different parts of the dust conditioner with rotary valve.

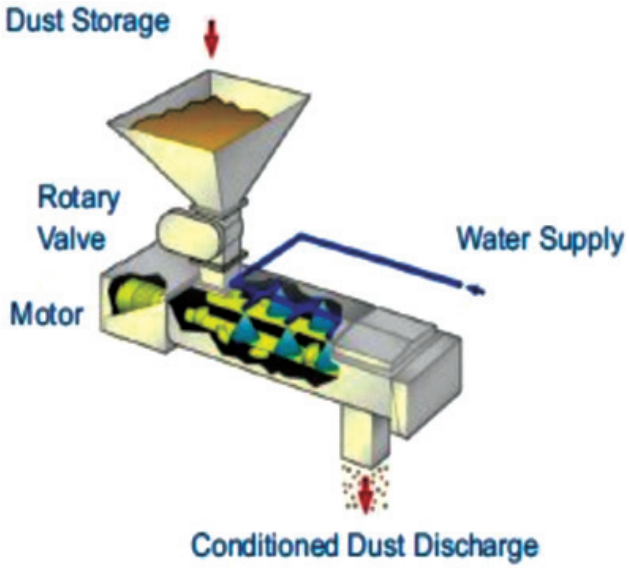

Figure 1: Dust conditioner with rotary valve

SCREW CONVEYOR

Figure 2 shows the different parts of the screw conveyor. Archimedes composed the main fasten transport in the third century B.C. It was utilized for expelling water from ships and for flooding farmland. The gadget comprised of an empty barrel with a middle shaft and a winding settled to the inward Wall of the chamber and focus shaft. As the get together pivoted, water was passed on and lifted starting with one area then onto the next. The turning some portion of the transport is just called as wood screw. At the point when a flat screw transport is utilized at the channel of tidy conditioner set up of turning valve, the stream of material by screw transport is even and the movement of pocket is helical so the impact because of gravity is unimportant and clinker gets balanced viably.

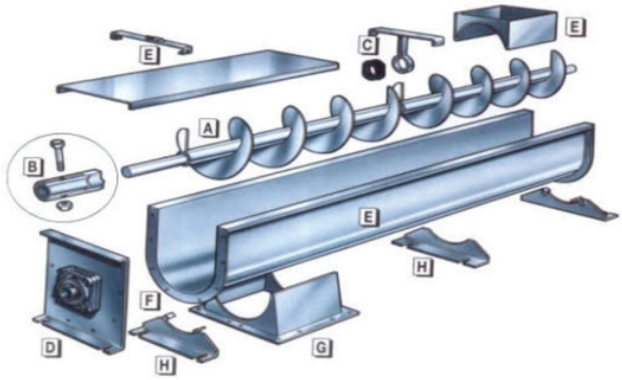

Figure 2: Screw conveyor

When all is said in done, the outspread freedom is vital parameter in screw transport. The outspread freedom should be no less than 1.5 times bigger than the greatest molecule size to avoid sticking of particles in the leeway space prompting molecule whittling down and expanded vitality misfortune. The leeway should be restricted a most extreme estimation of around 3 times of the greatest molecule size to avert over the top slip back and loss of proficiency at higher edges of rise. Estimation of screw pitch by and large differs from 0.8 to 1.0 times breadth D of the screw. The bump size of materials decides the base size of the screw distance across "D" to be picked. D is prescribed to be no less than 12 times the irregularity size of a measured material or possibly 4 times the biggest pieces of an un-sized material. Points of interest of the even screw Conveyors are: lessened danger of ecological contamination, the moved material is shielded from outside tainting, adaptability of utilization, practical unwavering quality, simple to introduce, simple to clean, can control extremely well the stream of free streaming materials.

RESULT ANALYSIS

Analysis and discussions are carried in this section. Total deformation process is carried out to show the performance of the system. The Screw transports are generally utilized for transporting mass material than different transports.

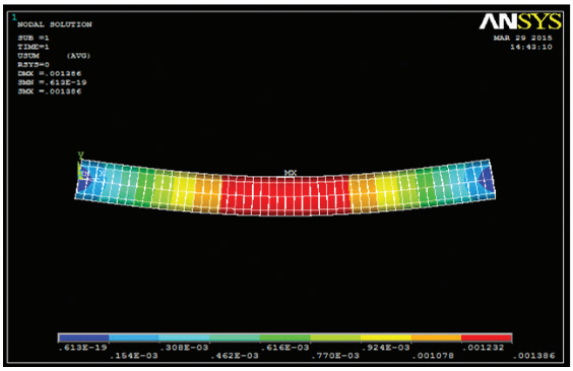

Figure 3: Total deformation

Figure 3 shows the graph for total deformation and Figure 4 shows Von mises stresses. The two mentioned graph show the performance of the dust conditioner.

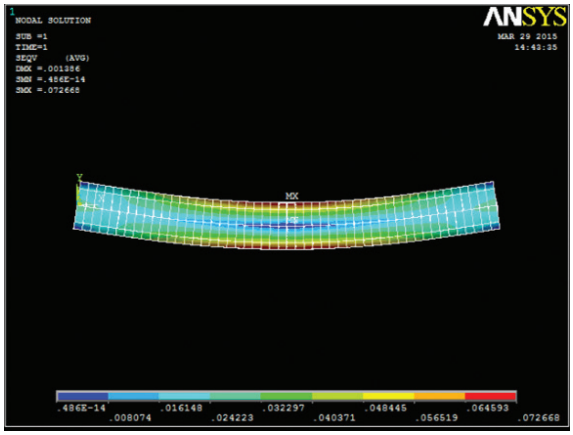

Figure 4: Von mises stresses

We examined that the torque relies on thickness, limit and different variables. The power utilization of Rotary sealed area valve (RAV) is seen to be 4.2 KW with clean conditioner and the power utilization with screw transport of same limit is watched 3.5 KW as clarified graphically in Figure 5.

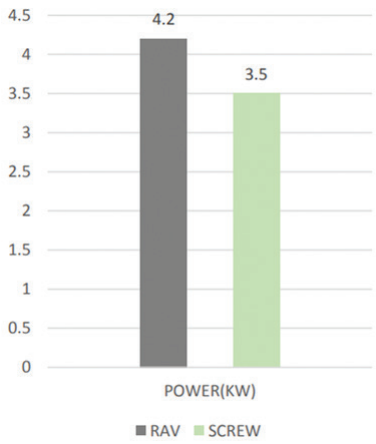

Figure 5: graph

CONCLUSION

From above, the fundamental issue worried in all clarification was utilization of fasten transport place of turning sealed area valve is protected and useful or not. So from examination result we found that screw transport is protected to use as most extreme aggregate redirection is under 0.26 inch and greatest von mises push is under 380 MPa which is yield quality of material. The power utilization in tidy conditioner with rotating valve is seen as 4.3 KW for 14.85 tons material exchange though in the wake of utilizing sink transport place of rotational sealed area valve the power utilization is seen to be 3.6 KW so screw transport is advantageous than turning valve.

Ethical Clearance: Taken from Mahendra Engineering College

Source of Funding: Self

Conflict of Interest: NA

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DOI Number: 10.5958/0976-5506.2018.00167.5

To Design Most Related & Recurrent Recommendation Algorithm for Relevant Information Retrieval with Content Rating Predations Accuracy for Similar Content E-learner

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ABSTRACT

Nowadays, E-learning is progressing in effective manner that improves the quality of education system in smarter way. Here, there is no age and time constraint for user to learn from web. The most of the widely recognized methods are utilized specific classification for learning content predictions. However, there are some difficulties still available to indentify, which content are more accurate and relevant to my query. There are some existing e-learning mechanisms suggested based on their personalization of learning content. However, it makes the entire learning process as complex and time consumption. To overcome these above issues, Most Related & Recurrent Recommendation (MRRR) technique is proposed for query analysis and learning content recommendation to expose the e-learning in better way. Proposed framework is arranged the content in interactive way with more graphical representation for high visualization. Here, content recommendation can be easily predicted with high accuracy for similar content learner. The techniques offer secure access and provisioning mechanism to retrieve most relevant content with minimal time. The paper main goal is to visualize learning content based on their prediction of content ranking for similar content. Once, query is processed by user, the method parses the query into attributes to retrieve the most relevant information in effective way. The technique establishes semantic relationship between the properties and meta-information to gather information about visitor of particular learning content. The rating prediction is computed for learning content based previous user satisfaction report. Based on experimental evaluation, proposed techniques improved the content visualizations success rate and minimized the query retrieval time with accuracy content rating predations.

Keywords: *for learning content predictions, content visualizations, content ranking, Most Related & Recurrent Recommendation (MRRR), meta-information, e-learning.*

INTRODUCTION

Personal Computer (PCs) is profound the way to utilize internet to instruct worldview. The traditional instruction framework has concentrated on transmitting the educator's learning to scholars [1]. Be that as it may, it has provided careful consideration to the next part of training, in specific in learning. Learning is the acquiring process of new mental schemata, information, capacities, aptitudes, and so forth, which can be utilized to take care of issues conceivably more effectively, encouraging basic leadership on the premise of involvement, which hoists "doing" as a reason for accomplishing a viable comprehension of the information [2] [3]. In the course of recent years, advanced media have enhanced the educating and learning encounters and have turned out to be ordinary with college scholars and teachers. Joint undertakings have been made over the most recent ten years by colleges in Los Angeles to present e-learning, i.e., the utilization of advanced media for educating and learning [4]. With money related help by the administration, colleges have been urged to create e-learning systems. These activities brought about an assortment of best-rehearse cases for e-learning and course improvement. The progression of e-learning at colleges is likewise affected by the advancement of specialized help, e.g., by the broad presentation of learning administration frameworks[5].

RELATED WORK

An overview performed in the year twenty-zero-six, more than three thousand scholars from different Los Angeles colleges were asked how frequently they utilize learning administration frameworks in their courses [6]. In the social and business sciences, sixty percent of scholars announced utilizing such frameworks 'in some cases' or 'habitually'. In different subjects, no less than thirty to forty percent of scholars announced utilizing such frameworks 'in some cases' or 'every now and again' [7]. Despite the fact that the utilization of e-learning at colleges has expanded vigorously, a modest thought is about scholars' desires and encounters. Up to this point, look into concentrated on scholars' encounters with particular parts of e-learning courses, e.g., the collaboration with an educator, learning with a particular learning administration framework, or certain qualities of a course [8]. The highlights of our exploration were to acquire a general perspective of scholars' desires of, and encountered in e-learning. By methods for relapse examinations, we explored those desires and encounters added to see learning accomplishments and course fulfillment. Our goal was not to look at particular courses or best-hone cases but to study a substantial example of scholars with a specific end goal to acquire an expansive depiction of e-learning as it is offered in Los Angeles colleges [9].

Proposed System: The quantitative contains an assessment of scholars' desires of e-taking in, their assessments of learning encounters, evaluations obviously results, and statistic. In the first place, scholars assessed the significance obviously attributes on a 6-point scale. Second, they assessed articulations portraying positive or negative learning encounters on a 6-point scale. Third, they surveyed their learning results and course fulfillment on a 6-point scale. Self-appraisals of learning accomplishments were decided for different reasons. The members were enlisted from an assortment of colleges and from courses with heterogeneous reviewing frameworks which can't be contrasted with one other. As opposed to grades, scholars' self-evaluations take the distinction between an understudy's learning prior and then afterward a course into record and render significant data about individual increments in information and skills. In a lead think about, it was discovered rather considered connections between's scholars' self-appraisals of accomplishments in media ability and scores measured by an accomplishment test. In Los Angeles, training at a college level is chiefly given by colleges and a college belongs to the field connected sciences worked concentrated on training. The two sorts of establishments offer examinations on a single man and ace level however colleges additionally offer investigations on a Ph.D. level. All colleges in Los Angeles offering e-learning courses at the season of the examination took part. What's more, no less than one college of connected sciences from every government state was enlisted.

Scholars Prospect and Improvement in Their Training Results: Scholars' desires adding to course results were researched. Different relapse investigations were made with the things of scholars' desires as free factors and three accomplishment factors in addition to fulfillment as needy factors. It accepted a direct connection amongst free and ward factors meaning would expect that increments in a single variable would be identified along with increments or declines in another, utilized for the different relapse examinations since it underpins the examination of the connection between arrangements of autonomous and ward factors in a single relapse investigation. As the example estimate was somewhat substantial, and keeping in mind the end goal to lessen the criticality in submitting an exclusive relapse coefficients with an importance were viewed as, the connection between an indicator and a rule variable after the impacts of other indicator factors have been evacuated. When translating comes about, one needs to remember that various relapses does not clarify circumstances and end results but rather portrays relations between factors or sets of factors.

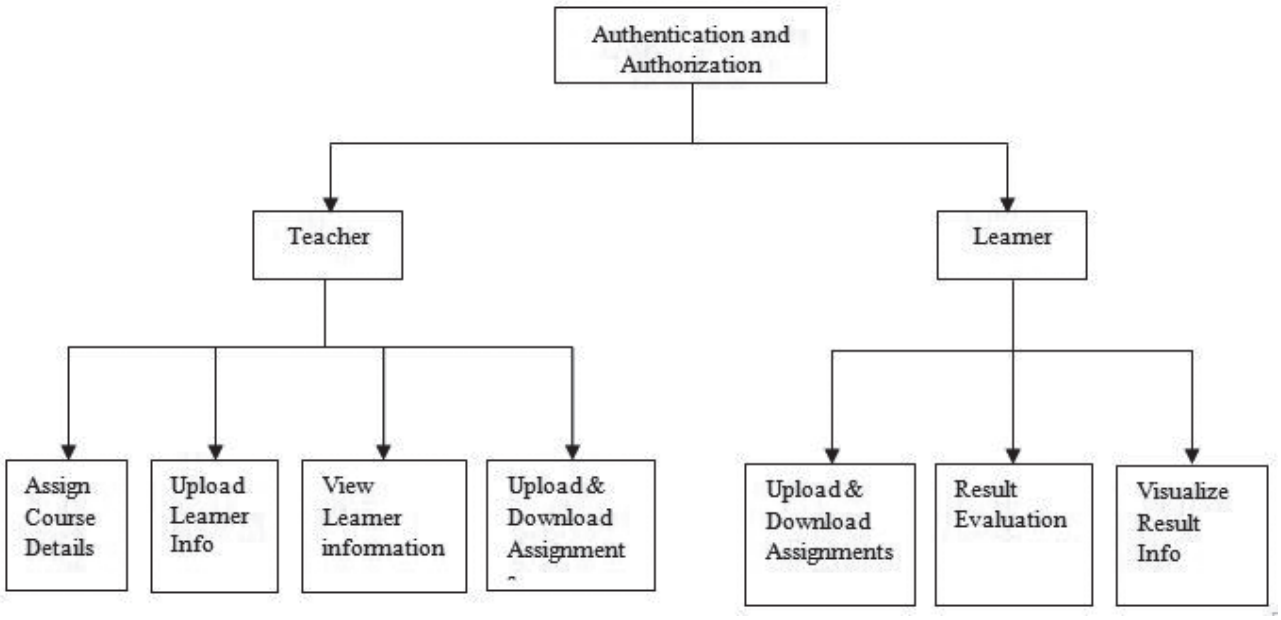

Figure 1: Process Flow Diagram of E-learning course information

Authentication and Authorization: The users can be categorized into different groups depends on their responsibilities. Primarily, two main responsibilities of users are presented such as Teachers and Learners. Course details and results can be uploaded to teachers' responsibilities. Learners are enrolled for the current course details and results will be uploaded to learners group.

Teacher: In the module, the teacher can access his/her homepage after login authentication. The teacher can view the learner details, course details and upload course materials details. The proposed MRRR mechanism aids teacher to develop the interactive information (with appropriate diagram according to realistic application) which supports learner to prefer e-learning frameworks. It modularizes the information in efficient way which supports learner to recover the information in easiest manner.

Learner: In the module offers majority interactive and user friendly application frameworks to learner after sign-in validation. Here, teacher can study about some field or any subject with their suitable time and place. In the module, tutor can search the terms or query from the application where proposed method recover the related content information depends on learner's query. Lastly, he/she can download and access the application from anywhere.

Upload Assignment/Result Details: The course and result information is uploaded. The next logical action for the teacher is to upload the course contents for the course assignments. It can be done via the upload assignment in the teacher's page. The teacher should login to the system and chose the course for which he/she wishes to upload course and result details.

Subject Assignment Details Uploading: The learners can upload assignment for all courses in a semester utilizing the single tool. The learner can upload all kinds of files such as documents, Zip files, text and excel sheets. It is not restricted to any type of data file. It is an excellent tool for a learner as they require not have to switch among different teachers web page sites.

Download Completed Assignment: In order to view the learner assignments, comments along with the results and the teacher can click on the assignment link, it viewed the student assignment/result information.

The Assignment field includes a book icon from which individual learner assignments can be downloaded. The learner submission date according to remarks is displayed next to the assignment field. The basic learner information like the name and the id are viewed. It will act as the leaner enrolled list as well. The teacher can take a print out of this page to list the quantity of learners enrolled in this course. The teacher can download the copy of the assignment or can display it online. It is a handy tool for the teachers while grading a learner assignment. He / she will accurately identify when the learner submitted the assignment and it also provides the learner to comprise their remarks while assignment submission. In the section provides an overall view of all the features and functions a teacher can perform utilizing this application.

RESULT AND DISCUSSION

Experimental Setup: The proposed method is implemented in JAVA programming environment using JDK(Java Development Kit) NetBeans 8.0 with Weka library with cancer disease symptoms datasets. The experimental setup uses a system with Intel Dual Core processor (1.836 Hz), 2GB memory under Window 7 Ultimate system. The proposed method retrieves various types of query given by the user and collects the information based on the respective dataset types

The proposed framework illustrates the mathematical model to improve the content classification accuracy and content retrieval time to encourage e-learning between elder ages and rural people. Here, learner can search the query correlated to his/her course information (Java/ OOPs theory's) and he/she can view the query outcome with appropriate diagrammatic illustration and realistic application. It performs following model such as content classification accuracy, content retrieval time and success rate.

Content Retrieval Time (CRT): The proposed system elaborated the mathematical model for code execution time. In the step, the method calculates content retrieval time in given applications. Content Retrieval Time (CRT) is computed as:

$$CET = \frac{\overrightarrow{d_j} \bullet \overrightarrow{q_l}}{\left|\overrightarrow{d_j}\right| \times \left|\overrightarrow{q_l}\right|}$$

Where, q_l is the learner query. In details ql = (w1, ql, w2, q_l, w3, q_l ……..wt,q_l) are coordinates in t-dimensional space. The t is an index of query vector which have weight w. D_j is total data files. In details dj = (w 1, j, w 2, j,... w t , j). Everyone has a weight for every keyword in the indexing framework.

Content Classification Accuracy (CCA): It illustrates the mathematical model of content classification accuracy in percentage (%). The content classification accuracy is computed depends on average value of precision, recall and f1-score of provided information by teachers where teacher offers content name, category, description and file.

$$CCA = \frac{2 \times Precission \times Recall}{Precission + Recall} \times 100$$

Where CCA= content classification accuracy, Precision illustrates level of measurement that yields consistent results when repeated. Recall is described as the amount of relevant files recovered by a query search in percentage.

Success Rate (SR): Success Rate (SR) described the success probability for learner query content retrieval. For success query, at least one query hit. Assume query resources are available in application as well on their provided hosting website. Assume queried resources are uniformly allocated in the network with duplication ratio D, and then SR can be computed as

$$SR = (1 - D)O$$

Where R is the duplication ratio and O is the occupancy. In the formula demonstrate the SR is depending on the occupancy of the content retrieval process and monitoring method.

For investigational estimations, proposed method utilized two different kinds of learner like Primary School pass Learner (5^{th}), and High School pass Learner (10^{th}) whose details are mentioned in table 1.

Table 1 demonstrates content classification accuracy in percentage (%), content retrieval time (CRT) in seconds and success rate (SR) in percentage (%) for primary school pass, middle school pass and high school pass learners. In the table demonstrates its average values for respective constraints with respective datasets. Here, proposed approach is estimated with several previous methodologies on provided constraints like a CRT, CCA and SR.

Table 1: Content Classification Accuracy (CCA), Content Retrieval Time (CRT) and Success Rate (SR) of Primary Pass, Middle Pass and High School Pass Learners

Learning Approach	Primary School Pass Learner			High School Pass Learner		
	CRT	CCA	SR	CRT	CCA	SR
LAMS	15	95	87	11	97	93
Moddle	12	89	84	7	93	91
MRRR	4	97	98	2	99	99

Based on table 1 outcome performances for primary school pass learner and high school pass learner, it demonstrates proposed Most Related & Recurrent Recommendation (MRRR) is best method. The content retrieval time represents the learner's query retrieval time with nearest challenger is Moddle. Behalf of content classification accuracy, it shows the content management accuracy of application with closest previous strategy LAMS. The success rate performs and highlights simplicity and ease to use of application. Here, nearest competitor was LAMS. Proposed MRRR method improves the content classification accuracy 2%, success rate 8.5% and reduce content retrieval time 10 seconds. Lastly, the paper claims that proposed Most Related & Recurrent Recommendation (MRRR) method is best strategy because it performs well on every respective constraint along with respective datasets.

CONCLUSION

The perspective contributes emphatically to learning accomplishments and course fulfillment: understudies' accomplishment objectives and the educator. Understudies, who considered picks up in capabilities as particularly critical, experienced higher accomplishments. Moreover, the consequences of our examination stress the educator's skill and part as an instructor and facilitator in learning. The teacher does not turn out to be less essential in e-learning. Despite what might be expected, understudies encounter the teacher's help and ability as particularly critical for the securing of information, aptitudes, and skills and for course fulfillment. Other than these factors, just a couple of others add to learning accomplishments or fulfillment: understudies' inspiration, open doors for self-directed and community oriented learning, and the clearness of the course structure. Teachers require a high level of instructive mastery in the execution of an online course. However, not all educators are adequately talented in the execution of e-learning as showed by understudies' evaluations. As of not long ago, be that as it may, just a couple of colleges in Los Angeles offer proceeding with training and preparing for e-learning educators. The aftereffects of our investigation stretch the significance of such further preparing. Proposed MRRR method enhances the content classification accuracy 2%, success rate 8.5% and reduce content retrieval time 10 seconds.

Ethical Clearance: Mahendra Engineering College

Source of Funding: Self

Conflict of Interest: Nil

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DOI Number: 10.5958/0976-5506.2018.00168.7

Fabrication of Sewage Cleaning System

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ABSTRACT

The thought process of the venture is to computerize the sewage cleaning process in seepage, to decrease the spreading of sicknesses to human. The dark water cleaning process counteracts bug pervasions by diminishing the buildups that can draw in and bolster bothers. It additionally enhances the time span of usability and tactile nature of sustenance items. In the proposed framework, the machine is worked with remote control to clean the sewage. Henceforth, this framework maintains a strategic distance from the effects from the sewage waste and its destructive gasses. This keeps the mosquito era from the wastage. The framework has a wiper engine that begins running when the set-up is exchanged on. Two power window engines are associated with the haggle is driven with the assistance of the remote control set-up. The procedure begins gathering the sewage squanders by utilizing the arm and it tosses back the loss into the canister settled in the machine at the base. An arm is utilized to lift the sewage and thus a can is utilized to gather them. The set-up runs even in sewage zone with water (restricted to a specific sum) so the wastages which coasts on the water surface likewise get gathered. The trash which influences the waste is likewise grabbed and evacuated. This framework has restricted human intercession during the time spent cleaning and thusly decreases spreading of maladies to humankind.

Keywords: *sewage cleaning system, water logging, water treatment, river surface cleaning system*

INTRODUCTION

Water is an essential need of human and every single living being. There is a lot of water on earth that is not reasonable for human utilize described in paper [1].The contaminations display in water can cause dangerous illnesses. Squander water is characterized as the stream of utilized water from homes, business enterprises, business exercises and foundations which are subjected to the treatment plants by a precisely composed and built system of channels. The greatest effect of cleaning the synthetic squanders can cause respiratory maladies and it plays a testing issue for the district officers. Water harm is delegated three sorts of debased water. They are perfect water and dark water [2]. Clean water is from a broken water supply line or spilling fixture. If not treated rapidly, this water can transform into dark water or dim water, contingent upon time allotment, temperature, and contact with encompassing contaminants. Dark water is polluted water that causes distress or disease [3]. It incorporates clothes washer flood; latrine flood with some pee, and dishwasher flood. Dark water is horribly debased and could cause extreme disease or passing if ingested and stayed away from, for example, flooding from waterways or streams, water from past the latrine trap, water [4] from the can bowl, or standing water that has started to help microbial development. A waste jettison is a limited channel that is burrowed along the edge of a street or field to divert the water. These days, despite the fact that robotization assumes an indispensable part in every single mechanical application in the correct transfer of sewages from businesses and sewage cleaning [5] is as yet a testing assignment. Waste channels are utilized for the transfer of sewage and tragically here and there might be loss of human life while cleaning the blockages in the seepage funnels. The district specialists are just dependable to guarantee that the sewage is spotless or not. Despite the fact that they clean the trench along the edge of structures, they can't spotless in wide sewages. The district laborers need to get down into the sewage [6] slime to clean the wide sewage. It influences their wellbeing gravely and furthermore causes skin sensitivities.

OBJECTIVE

The issue of water logging because of plastic, thermocole and metal prompts bothers development and it favors ailments like jungle fever, typhoid and so on. This is hazardous for human life and thus the possibility of this venture rose. The goal of the proposed extend is to outline and manufacture a computerized machine for seepage cleaning with a specific end goal to keep people from getting influenced by different sicknesses from the irresistible organisms introduce in the sewage while cleaning physically presented in [7]. This proposed framework is to limit or beat the issue confronted while utilizing man worked machine and to limit the expanded dumping rate of waste.

WORKING

When the setup is on, the sprocket and affix begins to pivot. This sprocket and chain gathers the waste materials from the sewage. The turn of the wheel is controllable, while the revolution of the sprocket and the chain is wild. The turn of the wheel is controlled by RF Module and the wiper engine pivots the sprocket and anchor is straightforwardly associated with the battery. The RF Transmitter goes about as a remote and sends the flag to the beneficiary. Thus the RF collector gets the signs and pivots the wheel as and when required. The RF module comprises of an encoder and a decoder. The elements of encoder are to change over 2n contributions to n yields. The recipient comprises of decoder and it changes over n contributions to 2n yields. RF beneficiary module is associated with the 4 channel hand-off which turns the engine clockwise or counters clockwise according to the given flag. The RF transmitter comprises of a remote switch. The flag transmitting is straightforwardly corresponding to the catch switch as it squeezed. The comparing pin energies the transfer and it thusly empowers the attractive curl. The gathered waste is transmitted to the container connected to the back of the setup and is expelled occasionally.

METHODS

Coasting waste like containers, plastic jars, covers and so forth, are lifted by lifters which are associated with the chain. The chain rotates with the sprocket wheel which is driven by an engine. At the point when the engine runs, the tie begins to course and it makes the lifter to move upwards. The wastage material are lifted by lifter teeth and put away in an authority canister. Once the gathering container is full, the waste materials are expelled from the receptacle physically. This proposed framework is like a remote worked auto utilizing RF transmitter and recipient. The yield is associated with the 4 divert hand-off board keeping in mind the end goal to exchange the flag by setting off a transfer. The framework comprises of remote switch, RF Transmitter, Encoder, 9V battery, Voltage controller, RF collector, Decoder and 4 channel transfer board. The RF transmitter transmits the flag as the switches are worked by human. The radio wire helps in transmitting the signs over a long separation and the RF recipient gets the flag transmitted by the transmitter.

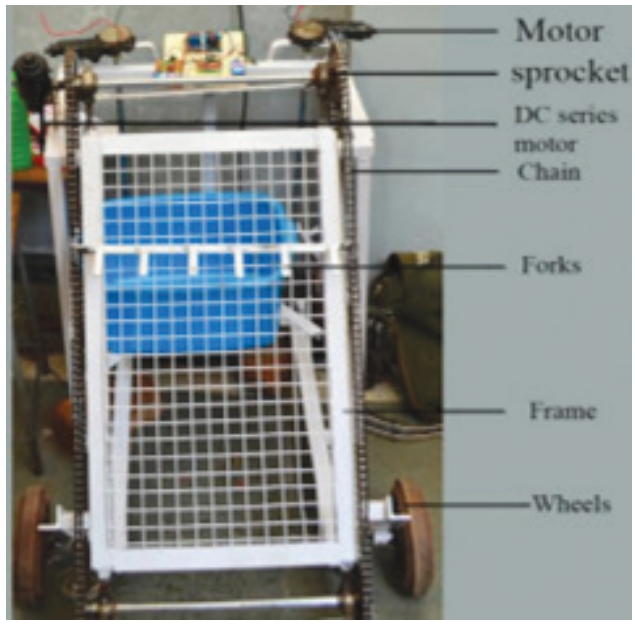

Figure 1: Treatment setup

Figure 1 shows the treatment setup. The setup includes motor, sprocket, DC series motor, chain, forks, frame and wheels. The wheels rotate as the process flow continues to be in the course of action. DC series motor is updated that in turn provides current scenario in the network.

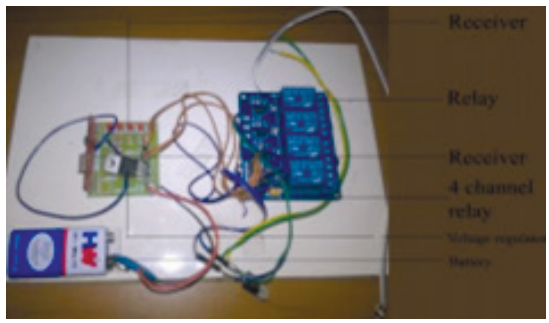

Figure 2: Electrical setup

Figure 2 shows the electrical setup in the communication network. The setup includes receiver, 4 channel relay, voltage regulator and battery. The receiver receives the signal from the input, process it and produce the desired output.

RESULTS

Sewage excesses are the basic reasons for sewage water waste harm to a specific territory. At the point when squander water channels are blocked, sewage water floods from the funnels into our home through its pipe framework. These reasons can generous property decimation, as well as the development of illness causing microscopic organisms which is perilous to our well being. For these essential reasons, it is important to have sewage evacuation performed rapidly and legitimately by an appropriate component. The mechanical setup is the last creation of the framework utilizing mechanical segments that incorporates external packaging. Once the plan meets the prerequisites, the continuous setup is created.

Battery is the primary wellspring of energy for the whole electrical circuit plan. Transfers and switches are utilized for successful working of the circuit. A voltage controller is utilized to direct the voltage according to the prerequisite. RF transmitter and beneficiary are utilized for remote control operation.

CONCLUSION

Modern services are becoming polarized. With the emergence of more and more automatic terminal services, modern services are also gradually becoming unmanned. Thus this semi automated sewage cleaning system helps in cleaning the sewage automatically and helps in decreasing the spread of diseases due to direct human intervention into the sewage. Since the system operation mainly depend on high level programming, it can be extended as per requirements. This system is time saving, portable, affordable, consumes less power and can be made easily available so that can use this system whenever and wherever. Thus, these kinds of machines operate based on the application of electronics engineering, mechanical engineering and electrical engineering, which are collectively termed as 'Mechatronics'. Drainage from industries is treated through this project to meet the national emission standards, with stable operation, low cost and good effect. Drainage wastewater control is treated by this method to irrigate plants, clean toilets, etc. This system functions move effectively during heavier rains, which have more volume of garbage running water.

Ethical Clearance: Taken from Mahendra Engineering College

Source of Funding: Self

Conflict of Interest: NA

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DOI Number: 10.5958/0976-5506.2018.00169.9

Trust Based Malicious Node Detector Scheme for Wireless Sensor Networks

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ABSTRACT

Applying security is must since Wireless Sensor Networks (WSN) works in open communication. Many types of attacks are considered here such as packet dropping and modification, misrouting. To alleviate the attacks and to efficiently detect the malicious node present Trust Based Malicious Node Detector Scheme (TBMNDS) is proposed. Each and every node has their own identity and distributed among other nodes during packet transmission. Trust factors are computed for each node based on their identity and the data is passed through trustable nodes. Simulated the scheme in NS-2 and recital analysis is evaluated by measuring the obtained results of proposed and conventional algorithms. Simulation results show that proposed method distinguishes the malevolent nodes powerfully and early on with low proportion of false detection.

Keywords: *Trust factor, malicious node detector, Misrouting, packet dropping, WSN.*

INTRODUCTION

WSN consists of distributed sovereign nodes each having sensing, calculating and communication capabilities. Mostly sensor nodes placed in the environment to cooperatively monitor the physical or environmental conditions that includes weather and ecological conditions such as sound, pressure, temperature, vibration, motion or noxious waste [1]. Nodes that are used to sense the environment are also called as mote that is capable of performing the operations. The 'mote' is placed to process the information and gathers the sensory messages then communicates with other nodes that are connected with each other in the network. Node transmits the sensed data to another node in order to reach the base station where all the information's to be stored. The information's are processed and used by the user should be a trustable one therefore the information should be transferred protectively [3].

Generally sensor nodes are exposed to a various attacks [2]. Aggressor node can pay attention to radio communications, transform the packet content before transmitting, misroute the data envelope to inadvertent subsequent hop node, inject false data in the channel, replay previously heard packets to drain the energy of other nodes as battery power is crucial in nodes. Attacker may deploy few malicious nodes with similar or better hardware capabilities or by 'turning' few legitimate nodes by capturing them and physically overwriting their memory. Sybil attack - attacker deployed nodes may also use the identities of the other genuine nodes to frame other genuine node as malicious. Packet dropping, modification, misrouting are basic problems which have large impact on the information gathered by sensor nodes as network loses lot of important sensed data. Cryptography techniques alone are not sufficient to protect the data. Attacks such as colluding collision [6], misrouting, power control, wormhole, rushing attacks can be launched without the help of cryptography keys.

RELATED WORKS

To handle the packet droppers and modifiers, multi-path routing [7-9] approach is widely adopted in which copies of a packet are forwarded along multiple paths to the destination Sink. Neighbour node observation or monitoring is another approach [10] used to find the packet modifiers, droppers and routing misbehaviour in sensor networks. In monitoring approach, nodes monitor their neighbourhoods promiscuously to collect information about the behaviours to identify the malicious activity and take future forwarding decisions. Monitoring method requires nodes to buffer the packets which are forwarded to next hope node and compares the packet

forwarded by next hop node with its buffered packet to find out packet modifications.

Energy consumption in both multipath routing and neighbourhood monitoring is not affordable for sensor networks since, many nodes observe each hop while a packet being forwarded. In [3], energy efficient sleep-wake approach along with local monitoring method is used to detect malicious nodes but cannot control the bad mouthing attack from observers. CPDM [4] proposed a scheme to detect packet modifiers and droppers without using multipath forwarding or monitoring approach, but the method identify the malicious nodes after long time operation of network and also have high false positive detection. CPMTS [5] proposed a scheme to overcome the issues with CPMD by making the child node to scrutinize the next of kin for triumphant or unsuccessful transactions, but undergoes packet misrouting assault.

In order to find the packet modifiers and droppers, Catching Packet Droppers and Modifiers (CPDM) [4] has been proposed however CPDM frames the source node even the intermediate nodes drop or modifying the information and the percentage of false isolation is high. Catching Packet Modifiers with Trust Support (CPMTS) [5] was projected to conquer the problems with CPMD. CPMTS does not deemed the Sybil assault and envelope consists of information misrouting attack, which impacts the basic packet modifier detection mechanism of CPMTS. The proposed approach CMNTS in this paper provide a solution for detecting attacks not considered in CPMTS.

TRUST BASED MALICIOUS NODE DETECTOR SCHEME–PROPOSED MODEL

Trust based malicious node detector scheme is proposed to identify the malevolent nodes efficiently which was present actively in the network. Each node in the network passes their sensed information with their respective identity. The trust value for each and every node is identified with their respective identity. Each and every node has fakely created identities for routing the data from sender node to receive node. Base station generates the fake ID's for each and every node and distributed over the network. Fakely created identity for nodes is used to calculate trust factor. The trust computational model is depicted in Figure 1 that includes all possible operation of the routing. The trust factor includes amount of packet generated at the sender side and the amount of packets received at the receiver side with respect to the number of dropped packets.

Trust Factor Computation: The trust factor computation includes quantity of packets sent at sender, quantity of packets lost by intermediate nodes and quantity of packets received by the receiver.

$$TF(n) = \frac{\text{Quantity of packets received}}{\text{Quantity of packets sent}} \quad \text{w.r.t. dropped pkts} \qquad \ldots(1)$$

The fakely created identity for the nodes is assigned for each and every node and the malicious behaviour of the node is identified with the help of trust factor calculation. Once the source node is ready to send the data then the base station generates number of fake ID's equal to the nodes present in the network. The node factors evaluate the fake ID's and allocate themselves for the route creation. Once the node ID is verified then the trust factor is calculated at the receiver side. If the quantity of packets generated is equal and above the reference point of the achieving packet level, then the communication is trustable and there is no malicious node present in the path. Malicious node can be detected by using trust factors of the corresponding node.

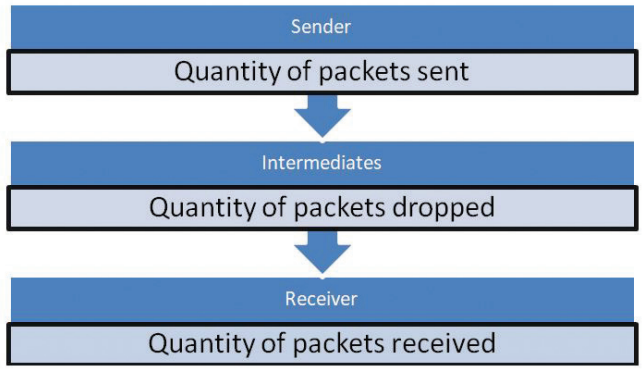

Figure 1: Trust Factor computational model

Fake Id allocation: Once the sender node and receiver node is set and the network is ready for communication, base station generates fake node ID's for each node. This fake ID collapses the malicious nodes that are placed to watch the network monitor process. The malevolent node's tries to modify the original packets to some other useless data by detecting the sender node ID. The malevolent nodes wrongly identify the sender using their original identity and modify the packet. But the real sender and receiver transfer their packet by using the

fake node identity that cannot hack by malevolent nodes. Therefore the base station hides the sensed information and transfers securely.

SIMULATION ANALYSIS

The performance of the proposed scheme is analyzed by using the Network simulator (NS2). The nodes are distributed in the simulation environment. The parameters used for the simulation of the proposed scheme are tabulated in Table 1.

The simulation of the proposed scheme has 50 nodes deployed in the simulation area 1000x800. The nodes are communicated with each other by using the communication protocol User Datagram Protocol (UDP). The traffic is handled using the traffic model Constant Bit Rate (CBR). The radio waves are propagated by using the propagation model two ray ground. All the nodes receive the signal from all direction by using the Omni directional antenna. The performance of the proposed scheme is evaluated by the parameters packet delivery rate, packet loss rate, average delay and throughput.

Table 1: Parameters used for simulation

Parameter	Value
Channel Type	Wireless Channel
Simulation Time	60 ms
Number of nodes	50
MAC type	802.11
Traffic model	CBR
Simulation Area	1000x800
Transmission range	250m
Network interface Type	WirelessPhy

Packet Delivery Rate: The Packet Delivery Rate (PDR) is the ratio of number of packets delivered to all receivers to the number of data packets sent by the source node. The PDR is calculated by the equation (2)

$$PDR = \frac{\sum_0^n \text{Packets Received}}{\sum_0^n \text{Packets Sent}} \quad \ldots(2)$$

The Figure 2 shows the received rate for proposed and conventional scheme. Proposed TBMNDS is higher than the PDR of the conventional CPDM. The superior value of PDR revenues the improved recital of the protocol.

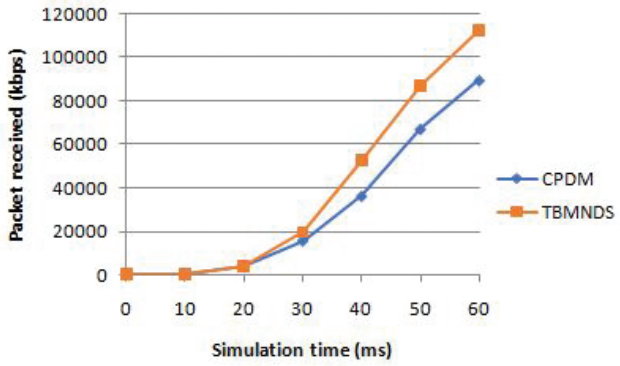

Figure 2: PDR

Packet Lost rate: PLR is the derived relation of lost packets to the sent packets. By taking the difference between number of packets lost and the number of packets sent, the PLR can be identified with accuracy and the equation for PLR is given in (3),

$$PLR = \frac{\sum \text{Packets lost}}{\sum \text{Packets Sent}} \quad \ldots(3)$$

Proposed scheme has lesser loss rate due to the reduction of malicious node existence in the transmission path when compared to the conventional CPDM which is shown in Figure 3. Higher loss rate in conventional mechanism indicates better performance of the proposed TBMNDS.

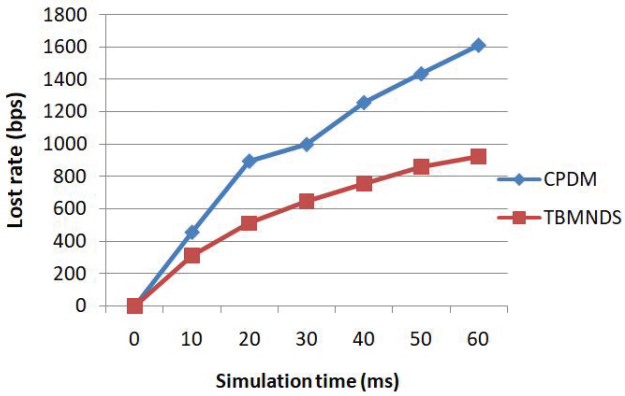

Figure 3: PLR

Detection Ratio: The malicious node detection ratio for both the proposed TBMDNS and existing CPDM protocols is shown in the Figure 4. The Detection Ratio is measured through the number of malicious node identified during data transmission. The number of malicious node present in the conventional is higher than the proposed and hence the proposed mechanism has low detection rate. The equation (4) gives the node detection calculation,

$$DR = \frac{D_{pn}}{T_{pn}} \quad \{0 < DR < 1\} \qquad \ldots(4)$$

Where D_{pn} is the no of precarious node detected by one or more normal nodes T_{pn} is the total no of precarious nodes.

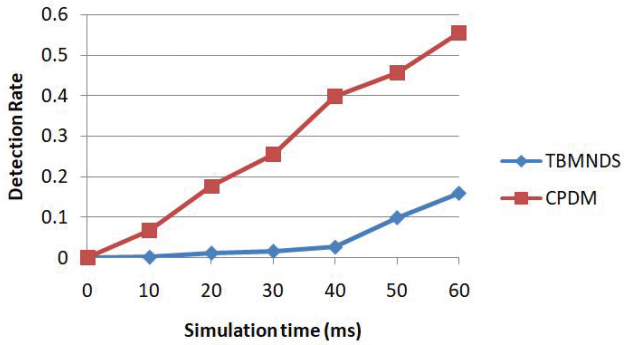

Figure 4: Detection rate

CONCLUSION

WSN works in open communication and supposed to several types of attacks like packet dropping and modification, misrouting. To alleviate the attacks and to efficiently detect and prevent the malicious node present in the path Trust Based Malicious Node Detector Scheme is proposed. Each and every node has their own identity and distributed among other nodes during packet transmission. Trust factors are computed for each node based on their identity and the data is passed through trustable nodes. Therefore secured transmission is done by generating fake ID's through base station. Simulation results show that proposed method distinguishes the malevolent nodes powerfully and early on with low proportion of false detection when compared to the conventional.

Ethical Clearance: Taken from Mahendra Engineering College

Source of Funding: Self

Conflict of Interest: NA

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DOI Number: 10.5958/0976-5506.2018.00170.5

Ultra Encryption Standard algorithm Based Data Security in WSN

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ABSTRACT

These days remote systems are quick, winding up more secure than their wired partners. Late innovative advances in remote systems administration, IC manufacture and sensor innovation have prompt the rise of millimeter scale gadgets that all in all shape a Wireless Sensor Network and are fundamentally changing the manner by which we sense, process and transport signs of intrigue. They are progressively turned out to be feasible answers for some trying issues and will progressively be conveyed in numerous zones, for example, in natural checking, business, and military applications. Be that as it may, conveying new innovation, without security as a primary concern has frequently ended up being nonsensically perilous. This likewise applies to WSNs, particularly those utilized as a part of utilizations that screen delicate data. This strategy has been tried on various records and the outcomes were exceptionally agreeable. The essential thought behind the execution is to fabricate a solid encryption technique, which ought to be unbreakable by any sort of animal power strategy or differential assault. Simulation analysis shows the performance of the proposed scheme compared to the existing scheme.

Keywords: *sensor technology, millimetre scale devices, simulation analysis.*

INTRODUCTION

In late computerized correspondence time, sharing of data is expanding essentially. The data being transmitted is powerless against different assaults. In this manner, the data security is a standout amongst the most difficult parts of correspondence in any advanced system. WSN's are rapidly picking up fame that they are possibly ease answers for an assortment of certifiable difficulties and are relied upon to assume a basic part in the up and coming period of inescapable registering. Be that as it may, the exceedingly obliged nature of sensors forces a troublesome test: their diminished accessibility of memory, preparing force and vitality prevents the sending of numerous cutting edge cryptographic calculations thought about secure. Therefore, the decision of the most memory-, preparing and vitality effective security arrangements is of essential significance in WSNs. To date, several authors have developed extensive analyses comparing different encryption algorithms.

RELATED WORKS

A steganography strategy shrouds any encoded mystery message in different advances. In step-1 the mystery message is scrambled utilizing TTJSA calculation. In step-2 we implant this encoded message inside one known picture or sound record utilizing 4-th bit from LSB substitution technique. In step-3 we again encode the implanted cover record utilizing TTJSA calculation. At long last implant this encoded cover record in last known cover document which might be some picture or sound document [1]. UES-I has been stretched out to UES-II by including one encryption module called TTJSA to make the encryption standard harder than UES-I. An encryption enter cushion in Vernam Cipher Method and furthermore the criticism utilized as a part of this strategy is considered to influence the encryption to process [2].

An Unobservable secure routing scheme offers complete unlinkability and content unobservability for all types of packets. This protocol is efficient as it uses a combination of group signature and ID based encryption for route discovery [3]. SJA is the blend of cutting edge Caesar Cipher technique, TTJSA strategy, Bit savvy Rotation and Reversal strategy. The encryption strategy comprises of three essential advances: Encryption Technique utilizing Advanced Caesar Cipher, Encryption Technique utilizing TTJSA Algorithm and Encryption Technique utilizing Bit savvy Rotation and Reversal [4].

In Decentralized distributed Space Time Block Coding (Dis-STBC) system, the knowledge about the Channel State Information (CSI) is not available at the transmitter [5]. Present day Encryption Standard rendition I (MES ver-I) is accomplished by part the document, which is to be encoded, and scrambling the part areas of the record in different ways utilizing TTJSA and DJSA figure techniques [6]. The strategy has been tried on various records and the outcomes were exceptionally agreeable. The essential thought behind the usage of MES ver-I is to assemble a solid encryption technique, which ought to be unbreakable by any sort of animal power strategy or differential assault [7].

Ultra Encryption Standard Algorithm: As the writing audit has the more prominent effect on effectiveness and more secure cryptography, we need to actualize Modern Encryption Standard Cryptography for Data security reason. Likewise we have to cross watch that the handling and execution of the calculation ought not cause defilement of data in the first information or message and furthermore the extent of the enciphered content ought not be bigger than the first plain content. Furthermore, there ought to be no redundancy of example in the yield, which is to be dealt with, while actualizing the Modern Encryption Standard (MES) calculation. The cryptographic technique recommended in this paper is a sort of new symmetric encryption standard calculation which is an augmentation of the past work of the creators i.e. UES adaptation II and III. Roy et al as of late created couple of effective encryption techniques such as UES rendition I, Modified UES-I, UES adaptation II and UES variant III. Here the creators have utilized three distinctive kind of cryptographic technique .Those strategies are various encryption, bit-wise reshuffling strategy and bit-wise columnar transposition strategy. This system is the extension of UES-III and partly UES II.

The calculation coordinates bit-level columnar transposition and bit astute reshuffling. It registers 'cod' which controls the various encryption number and 'v' which is the columnar succession generator. It parts the plain records into bits, encodes it and afterward changes over it back to bits. The chart underneath demonstrates the working of the UES IV calculation. It at first concentrates 2 bytes at any given moment and performs bitwise reshuffling and columnar transposition of the extricated information. It at that point removes the following 2 bytes and plays out a similar procedure until the point that the whole record is encoded or the quantity of leftover bytes is not as much as the quantity of separated bytes. It at that point rehashes a similar method by separating 8, 32 and 128 bytes of plain content bytes at any given moment.

SIMULATION ANALYSIS

The performance of the proposed scheme is analyzed by using the Network Simulator (NS2). The NS2 is an open source programming language written in C++ and OTCL (Object Oriented Tool Command Language). NS2 is a discrete event time driven simulator which is used to model the network protocols mainly. The nodes are distributed in the simulation environment.

The simulation of the proposed scheme has 50 nodes deployed in the simulation area 900×900. The nodes are communicated with each other by using the communication protocol User Datagram Protocol (UDP). The traffic is handled using the traffic model CBR. The radio waves are propagated by using the propagation model two ray ground. All the nodes receive the signal from all direction by using the Omni directional antenna. The performance of the proposed scheme is evaluated by the parameters packet loss rate and throughput.

Packet Loss Rate: PLR is defined as the difference between the sent packets and received packets in the network per unit time as in equation 1.

$$PLR = \sum_{0}^{n} \frac{\text{Number of Packets dropped}}{\text{Number of Packets Sent}} \quad \ldots(1)$$

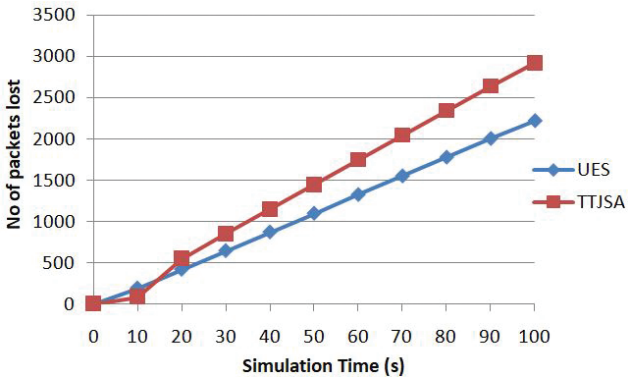

Figure 1: Packet Loss rate

Figure 1 shows the PLR of TTJSA is greater when compared to that of UES. The number of nodes is increased when the number of packets dropped is increased.

Throughput : Throughput is defined as the data that can be transferred from source to the receiver in a given amount of time. Throughput is obtained using equation 2.

$$\text{Throughput} = \sum_{0}^{n} \frac{\text{Number of Packets Received}}{\text{Time taken}} \ldots(2)$$

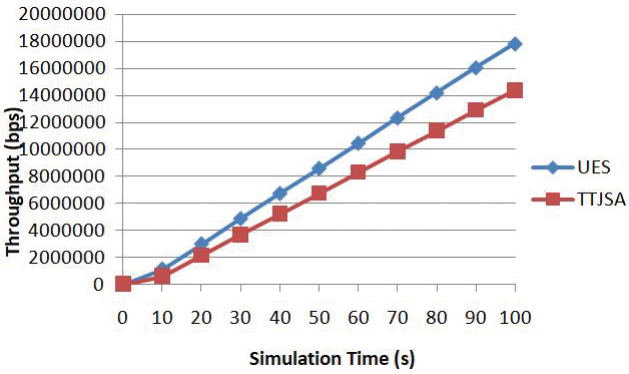

Figure 2: Throughput

It is observed from Figure 2 that the number of packets received successfully for UES is greater compared to that of the TTJSA.

CONCLUSION

The proposed strategy is too difficult to break by utilizing any sort of animal power technique. As specified before have connected our technique on some known content where the single character rehashes itself for various circumstances and we have discovered that after encryption there is no redundancy of example in the yield record. Besides, it must be recalled, if the figure document is altered and certain character(s) in the record get adjusted, it is difficult to recover the plain document, since the input produced will be distinctive for various characters. The present technique won't work if the plain content document contains all ASCII character 255 or ASCII character 0.

Ethical Clearance: Taken from Mahendra Engineering College

Source of Funding: Self

Conflict of Interest: NA

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DOI Number: 10.5958/0976-5506.2018.00171.7

Establishment of a Breast Cancer Biobank for Translational Research: A Single Institutional Pilot Study

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ABSTRACT

Introduction/Background: Current Breast Cancer (BC) knowledge has primarily emerged from translational research in western populations. Given the genomic and population diversity, mere extrapolation of this knowledge to BC in Indian women is incorrect. Hence, Indian-population specific research resources are needed[1]. Herein, we describe the creation of a pilot BC BioBank as a repository of clinically annotated bio-specimens from BC patients at our clinic.

Purpose: To establish a BC Biobank for collaborative translational research

Methodology: Given its high prevalence in India, our pilot study focuses on a BC subtype named Triple Negative BC (TNBC). Retrospective data (i.e., medical history, clinico-pathology, imaging, surgery, chemotherapy and post-treatment status etc.) was collected after informed consent from TNBC patients. Formalin-fixed paraffin-embedded *(*FFPE*)* tissue from post-surgery samples was also collected. In addition, Radiology images of TNBC were analyzed to identify unique imaging characteristics.

Results and Discussion: Out of 115 registered TNBC cases at our clinic, a pilot BioBank was generated with clinical data and FFPE blocks of 44 samples. Clinico-pathology details and medical history were meticulously collected for this study cohort. From these cases, extensive radiology imaging analysis was performed on 25 cases to identify unique Mammography or SonoMammography features of TNBC in Indian women.

Research Implications: The DNA from FFPE blocks of TNBC tumors is being used to identify mutational patterns in cancer-specific genes. The TNBC Imaging database has generated collaborations with imaging scientists to identify unique radiological features of Indian TNBCs.

Novelty/Originality: In this project, we have created a novel research repository for TNBC-themed research in Indian women. This unique project is acting as a driver for multidisciplinary research collaborations with scientists from academic and private sectors.

Keywords: *Biobank, Triple Negative Breast Cancer, Translational Research*

INTRODUCTION

The incidence of Breast Cancer (BC) is on the rise in Indian women and it is estimated that the current life-time risk for developing BC in urban Indian women is 1 in 22 (ICMR Reports, 2009-11). Half of the women with a diagnosis of BC are under the age of 50, which is a decade earlier than that seen in the West, and the Age-Standardized-Ratio (ASR) is 33 per 1,00,000 population [1]. India has the highest BC incidence-to-mortality conversion rate in the world mainly attributed to late-stage presentation and hence, poor treatment outcomes[2].

Based on the presence of specific protein biomarkers, BCs are immunohistochemically sub-divided into clinical subtypes namely Hormonal (i.e., presence for estrogen receptor (ER), progesterone receptor (PR)), HER-2 positive (i.e., presence of Human Epidermal Growth Factor Receptor-2) and Triple Negative BCs (TNBCs). TNBC represents a clinical subtype of breast

carcinomas defined by the absence of expression of three main predictive biomarker namely ER, PR and HER-2[3].

Importantly, the prevalence of TNBC subtype in India (at 30%) is twice as much as the reported levels in Western cohorts[4-5]. Due to its aggressive nature and the lack of effective targeted therapies, patients with TNBC generally have a poorer prognosis (at least 10% lower disease free 5-year survival rate) vis-à-vis other BC subtypes[4]. Despite an initial favorable response to chemotherapy, disease recurrences are all too common within the first 3 years after initial therapy[6]. The majority of TNBC tumors are highly malignant with aggressive behaviour and most importantly presented among young women. Moreover, the high likelihood of visceral metastasis and shorter disease free survival in subgroups of TNBC patients is a matter of major concern for oncological outcomes[6].

Current chemotherapy regimens are prescribed empirically without *a priori* determination of the optimal combination of anti-cancer drugs owing to the absence of validated companion diagnostics. In addition, the identification of the TNBC subtype by a negative definition without a corresponding set of positive criteria has led to the grouping of what is clearly a very heterogeneous sub-[8 9]. Attempts over the past 5 years to dissect the heterogeneity have provided interesting leads[10], which as in the cases of many other human diseases, may or may not hold true for Indian populations. Furthermore, despite intense scrutiny by the scientific community and varied attempts by clinicians, there has been no major break-through in the clinical management of TNBC patients. Observations in several BC clinics in India and abroad have corroborated the underlying difficulties in treating this aggressive disease.

Notwithstanding the demographic differences, the relative contributions of genetic and behavioral factors (including nutritional and reproductive) of the Indian population to this higher TNBC incidence are yet to be established. There is also a need to systematically examine the correlation between clinico-epidemiological factors such as parity, BMI, T2DM and the TNBC sub-type in Indian women. Thus, there exists a clear unmet medical need to understand the biological and clinico-epidemiological characteristics of TNBC disease in the Indian context and a distinct opportunity to improve clinical outcomes by personalizing chemotherapy regimens. In addition, the unrestricted availability of data from multi-platform-omics analysis of hundreds of TNBCs (for e.g., databases such as TCGA 2015, METABRIC) makes this an opportune point-in-time to perform in depth focused clinical validation of rationally chosen molecular signatures and more extensive cross-ethnic comparisons [11] Modern-day Translational Cancer Research has immensely benefited by creation of Cancer BioBanks. BioBanks are ethically developed repositories of clinical data from patients and meticulously annotated biospecimens (for e.g., primary tissue, formalin-fixed paraffin blocks (FFPE), blood, urine, saliva, DNA, RNA etc.). Such repositories established in major cancer centers all over the world have provided invaluable information to cancer researchers in the design and development of predictive and prognostic biomarkers as well as new therapeutics[12].

In this paper, we describe a pilot project aimed at creation of a single institution TNBC BioBank aimed to serve as a research repository of Indian women affected by this disease.

METHODOLOGY

Study Population: This study is based on a retrospective and prospective data and biospecimen collection strategy conducted after approval of an Independent Ethics Committee. The study population includes TNBC patients registered at Orchid Breast Health Centre (OBHC), Pune and its allied centers. The inclusion criterion includes women diagnosed with TNBC who were willing to share their clinical history and FFPE blocks along with informed consent.

TNBC Clinical Management: Clinical protocols for TNBC diagnosis and management at OBHC were based on the National Comprehensive Cancer Network (NCCN) guidelines. Briefly, following the clinical breast examination by Breast Onco-surgeon, suspected cases were investigated by Radiologists using imaging modalities namely Full Field Digital Mammography (FFDM) with 3-D Tomosynthesis or Automated Breast Volume Scanner (ABVS) with an age cut-off of above 40 years and below 40 years, respectively. Thereafter, suspicious cases underwent precision biopsies either by use of Mammotome Biopsy, Vacuum-assisted Biopsy or Tru-Cut biopsy. Biopsied tissue samples and/or lymph nodes from suspected cases were sent to NABL-accredited pathology labs for further histopathological investigations inclusive of Nottingham Score and

Immunohistochemistry (IHC) for determination of ER, PR and HER-2 receptor status. On IHC, ER and PR were considered positive if >1% tumour cell nuclei were immunoreactive and negative if found otherwise. To establish HER-2 status, FDA test guidelines (0 and 1 is negative, 2+ is borderline, 3+ is positive) were used. Samples that were HER-2 negative on immunohistochemistry were further analysed using Fluorescence In-situ Hybridization (FISH). Based on immunohistochemistry findings the BC cases were divided into respective clinical subtypes.

Confirmed BC cases underwent appropriate BC surgery (e.g., modified radical mastectomy or breast oncoplastic surgery) at a network hospital site. The surgically excised healthy and BC tissues from the operative patient are then sent to NABL-accredited partner pathology labs for further investigations. Based on the clinical staging of the disease, standardized chemotherapy regimens as per NCCN guidelines were applied either prior to surgery (neoadjuvant chemotherapy, NACT) or post-surgery (adjuvant chemotherapy, ACT) under the supervision of a Medical Oncologist at the chemotherapy day-care facility of the OBHC. Furthermore, for margin-positive and multiple-lymph node positive BCs, a standardized radiation therapy protocol was utilized under the supervision of a Radiation Oncologist at the partner hospital site as per NCCN guidelines.

BioBank Protocols: Patient clinical registry was maintained at OBHC as part of Medical records. After a counselling and questionnaire session for study participants by clinical research staff, informed consent was obtained. The clinical data generated included demography (age, menopausal status), medical data (e.g., radiology imaging data, FNAC or biopsy, HPE with grade, surgical HPE, TNM staging, chemotherapy, radiation therapy) and survival status (e.g., follow-up, disease recurrence, local or distant metastasis, death due to disease or other than cancer, death due to treatment toxicity, last follow-up, loss to follow-up, shifted to other hospital or city for treatment etc.). Clinical data was stored in appropriate Hospital Information Management System (HIMS) by de-identifying the patient name.

For this pilot study, clinical data and post-surgery FFPE tumour blocks were collected both prospectively and retrospectively only from TNBC patients who gave informed consent in local language. If the patient agreed to participate in the study, appropriate provisions were made for collecting the FFPE blocks without causing travel inconvenience to them. To ensure privacy and confidentiality, appropriate sample codes were generated which were only accessible to the senior researchers on the study. Every tissue block was collected along with the histopathology report and stored in a cool dry place under lock and key. A separate log book is maintained for the tissue storage. These TNBC BioBank samples and clinical data were further used for research studies initiated by OBHC.

TNBC Radiology Database: From the study population of histopathologically-confirmed TNBC cases, Radiology image analysis was carried out on archived databases. FFDM (Siemens Mammomat Inspiration ™) and SonoMammography (Siemens S2000 ™) images were analysed using BIRADS lexicon. Data on Sonomammography images, Colour Doppler studies and Strain and Shear elastography were available for all cases. Masses were evaluated for size, shape, margins, density, posterior acoustic features, presence or absence of calcification. Other associated features such as architectural distortion, skin thickening, nipple retraction and status of axillary lymphadenopathy were analysed.

Data Analysis: Preliminary statistical analysis was performed based on proportion of cases (from pilot study) identified with features of interest. Appropriate statistical tools (MS-Excel) were used for data management and analysis.

RESULTS

Clinico-Pathological Characteristics: During the period of January 2012-January 2017, 115 histopathologically confirmed TNBC cases were registered at OBHC and its allied centres. Out of this patient pool, we could establish contact with only 65 patients willing to participate in the study. Of the 65 cases, 44 subjects could share their complete clinical history as well as the FFPE blocks. Thus, this pilot study was restricted to a sample size of 44 cases which included TNBC cases ranging from early to advanced stage, NACT and ACT as well as radiation therapy.

The mean age of the patients was 49.7 years with a range of 31-78 years. 23 cases (52%) were postmenopausal while 21 (48%) were premenopausal. Analysis of the histopathology grade and Nottingham Scores indicated that this TNBC study population had

higher number of cases of IDC Grade II (i.e. 21 /44; 48%). More than half (23/44; 53.5%) cases had a tumour size in between 2-5 cm indicating a predominantly T2 status of these tumours (Figure 1 A-D - Data represents actual numbers from study cohort of 44). 25% cases (11/44) were found to be node-positive (N1 status). 15 of the 44 (34%) cases indicated clinical staging of the disease as Stage IIA suggestive of loco-regional, early disease status. A majority of these cases (34/44; 79%) underwent NACT while the 21% cases (9/44 cases underwent ACT with NCCN-recommended regimens. The most commonly used NACT and ACT regimens were FEC (5-FluoUracil, Epirubicin and Cyclophosphamide) and CAT (cyclophosphamide, Adriamycin and Paclitaxel) respectively. Survival analysis indicated that majority (83%, 36/44) of TNBC patients in this study pool were alive. Oncological outcomes indicated that 6/44 (13.6%) cases had progressive disease with distant metastasis. Recurrent disease was not found in this TNBC study cohort.

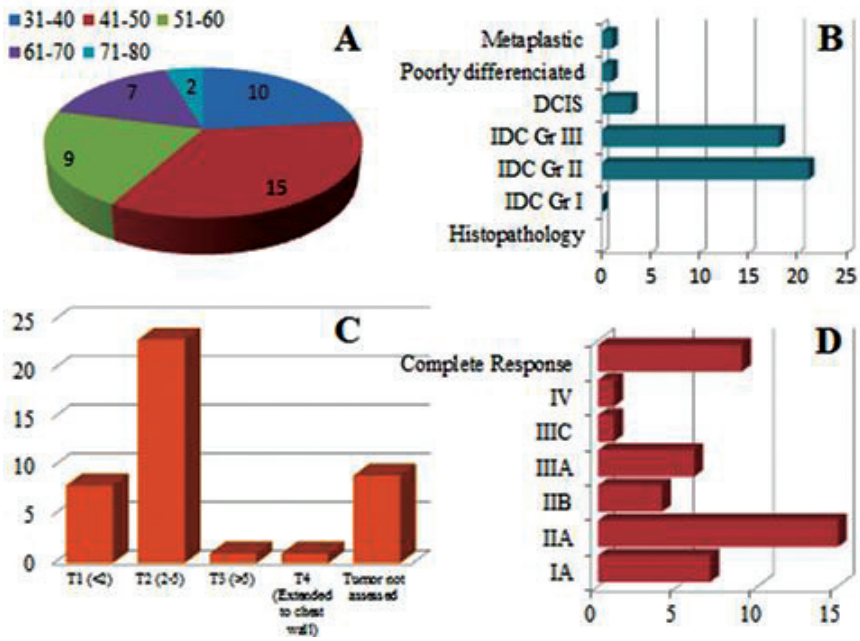

Figure 1: Clinico-Pathological Characteristics of Pilot TNBC BioBank

A: Age Distribution, B: Grade of Disease, C: Size of Tumor (in cm), D: Clinical TNM staging

Radiological Characteristics: Out of 44 cases in the TNBC BioBank, 25 cases were included for the Radiology image analysis study. FFDM images with Digital Breast Tomosynthesis were available in 22 out of 26 patients. Mammographic images indicated that 30 lesions were masses. While no asymmetries were found, one lesion was grouped as microcalcification without discrete mass. 85% masses had irregular shape (Table 1).

Table 1: Mammographic Characteristics of TNBC

22 patients with 31 tumors		
Parameters	**Number (Total), Out of 31**	**%**
Appearance		
Mass	30	96.8
Focal Assymetry	0	0
Isolated Calcification	1	3.2
Architectural Distortion	0	0
Micro Calcifications		
Absent	25	80.6
Amorphus	1	3.2
Coarse Heterogeneous	0	0
Linear Branching	1	3.2
Fine Pleomorphic	4	12.8
Associated Features	**Number Total, Out of 22**	
Architectural Distortion	5	22.7
Skin Thickening	4	18.2
Oedema	4	18.2
Nipple Retraction	2	9.1

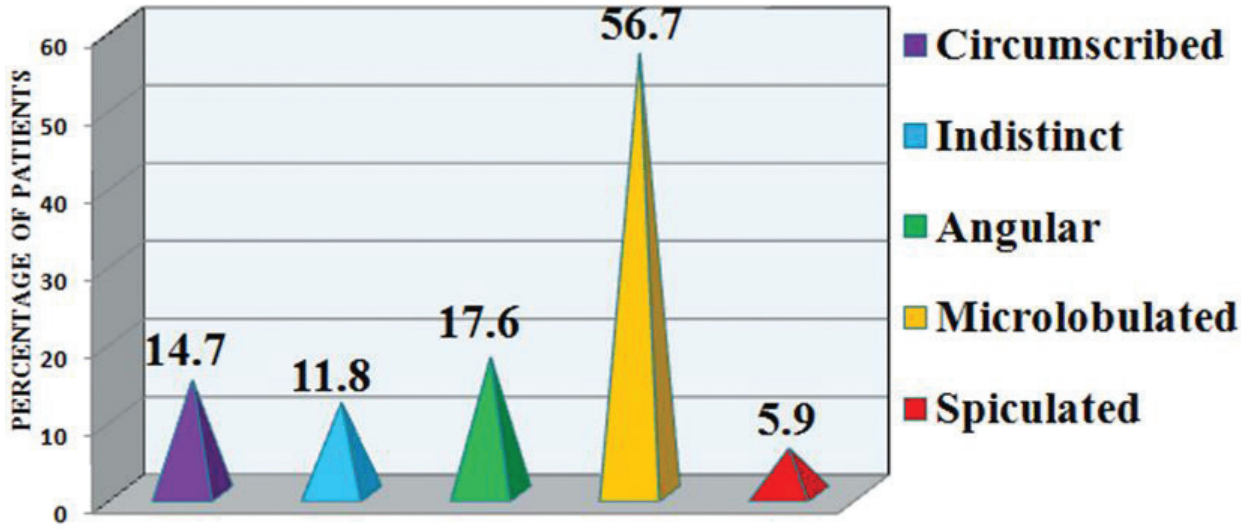

Figure 2: Sono Mammography Features of TNBC (Margin of Masses)

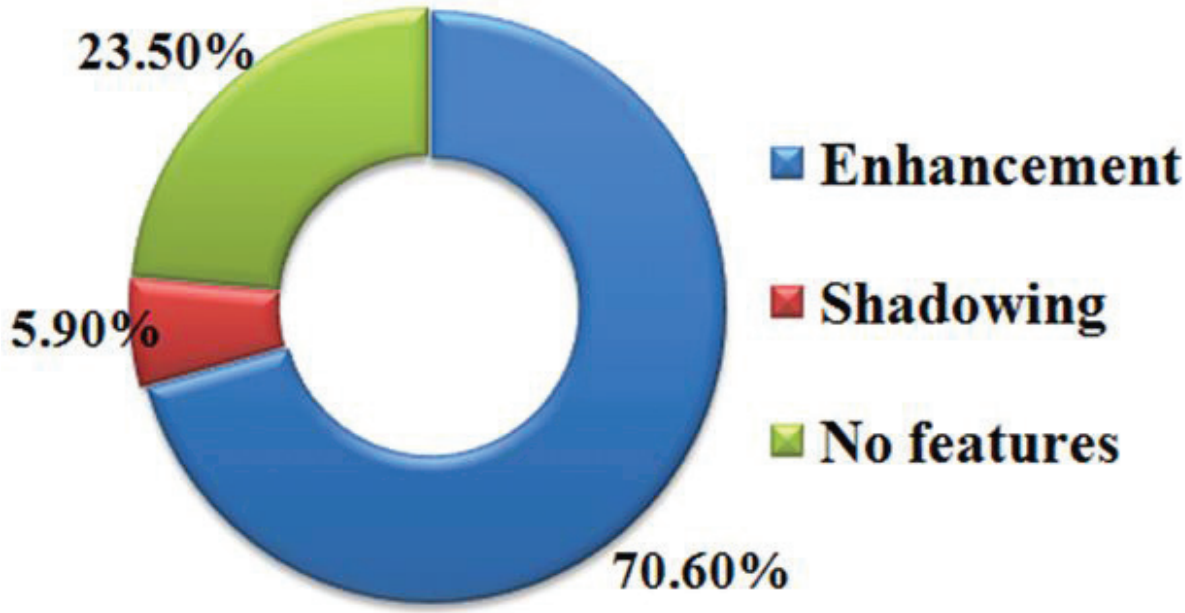

Figure 3: Sono Mammography Features of TNBC (Posterior Acoustic Features)

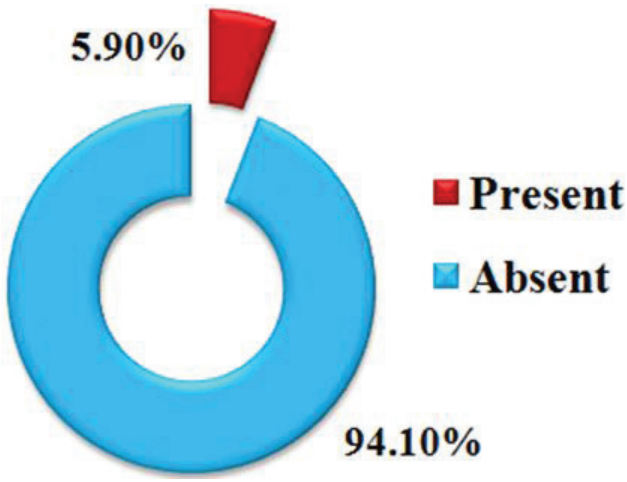

Figure 4: Sono Mammography Features of TNBC

(Perilesional Echogenic Halo)

Tumour margins were most often partially circumscribed and partially obscured on mammography (38%) followed by microlobulated (19%) on SonoMammography. Spiculated margins were found only in 3 of 26 masses. Only 3 masses had intralesional microcalcification. Architectural distortion, skin thickening & nipple retraction were found in only 10-20% cases. On SonoMammography, microlobulated margins were most common (57%) followed by circumscribed (10%). Posterior acoustic changes were most commonly seen as enhancement (70%). Perilesional echogenic halo was present in only 2 masses. Preliminary comparisons between case studies representing TNBC images with other BC subtypes and breast abnormalities indicate that TNBC may appear similar to benign lesions (Figure 3).

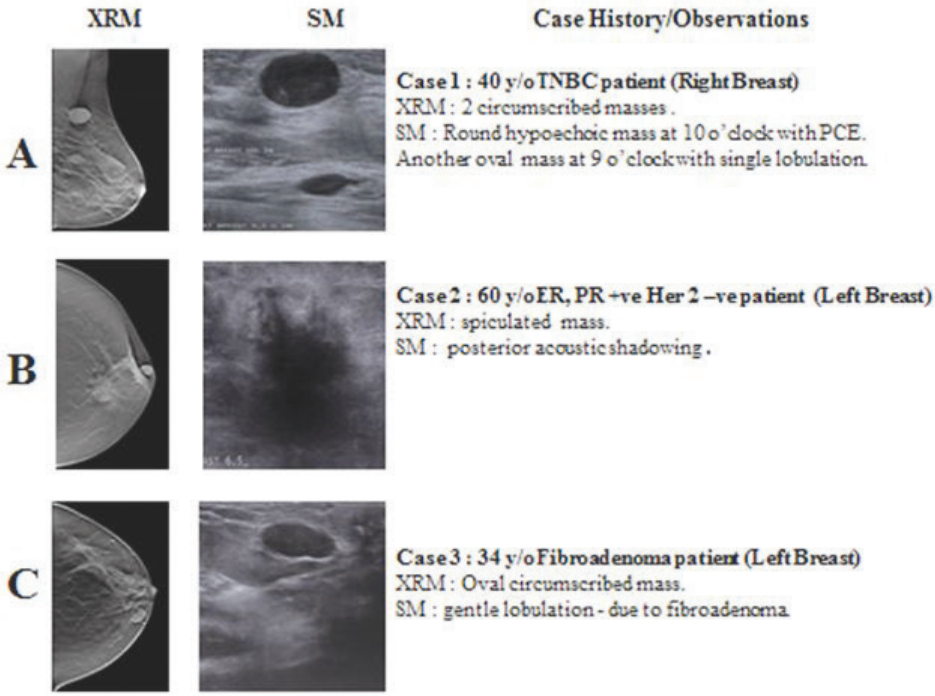

Figure 5: Comparative Analysis of TNBC tumors on Radiology Imaging
A: TNBC Case, B: HER-2 positive case, C: Fibroadenoma, XRM: Mammography, SM: SonoMammography

DISCUSSION

TNBC represents a clinical BC subtype with aggressive biology, difficult clinical management, high risk of recurrence and hence, high mortality[18]. Thus, this disease remains a key focus area for of many BC researchers.

Translational Cancer research aims to apply findings from fundamental biology research into medical practice and meaningful health outcomes. Even though several translational TNBC research programs are active, breakthroughs in understanding the TNBC molecular profile that may influence clinical management of the disease are eagerly awaited. Interestingly, such intensive research efforts focused on understanding TNBC biology has identified the complex heterogeneity of this cancer along with novel predictive and prognostic biomarkers which are being explored for clinical drug development[10].

Most of the translational research that has influenced the guiding principles of modern-day TNBC clinical management has emerged from studies on western populations[13,14]. Several studies have indicated that African American women have a higher propensity towards TNBC as compared to Caucasian women[15]. Importantly, the prevalence of TNBC in Indian women is highest in the world (30% as compared to 10-15% in the west)[16,5]. The etiological reasons underlying the increased TNBC risk burden in Indian women are expected to be different from that in the western populations. Indeed, it is a well-documented fact that the global diversity in populations arises due to socio-economical, psychological, physiological and biological

differences across ethnicities[17]. Therefore, it is incorrect to simply extrapolate the research findings and TNBC management guidelines from western societies and apply to the Indian context. The lack of similar research in Indian women signifies a knowledge gap which can be only bridged by undertaking India-specific research programs in TNBC focused on the local context and population.

World-over, translational BC research has largely benefited from BC BioBanks which have provided invaluable clinical data and biospecimens for comparative studies between clinical subtypes as well as healthy women [18]. However, limited efforts have been noted in India towards undertaking similar BC BioBanking approaches. With this background, OBHC has embarked on the creation of a pilot BC BioBank at our institution with focus on TNBC data collection.

Although limited in its scope and sample size, the present data has revealed few interesting observations. Close to 60% TNBCs patients diagnosed in our study cohort had age less than 50 years with a tumour size between 2-5 cm (T2 status). Majority of TNBCs appear to be of Grade II with clinical staging of Stage IIa representing locally operable BCs. In the past few years, TNBC imaging analysis in comparison to other BC subtypes has been an active area of Radiology research[19,20]. Interestingly, our radiological imaging study on a subset of TNBC tumours has identified potential differentiating characteristics that may aid in the visual analysis by Radiologists. We observed that TNBCs lack typical radiological features of BC namely spiculated margins, posterior acoustic shadowing and microcalcification[21-23]. In contrast, TNBCs show circumscribed margins and posterior acoustic enhancement. The comparison of our findings with reference to literature is presented in Table 1.

This pilot study aimed at creating a TNBC BioBank has inherent limitations. Despite the interesting findings, the current BioBank-initiated study with limited sample size is not qualified to make any major conclusions on the unique clinic-pathological or radiological characteristics of TNBCs in India women. Further, being a single-institutional study, the data collection may reflect investigator bias. Given the high loss-to-follow-up rates in the study cohort, there is scope for improvement of clinical data management protocols at OBHC to ensure up-to-date maintenance of case record forms of patients visiting the clinic. Innovative methods such as maintaining regular contact with BC patients treated at the clinic (via pink-ribbon patient support groups) are being undertaken so that patients are sensitized to timely follow-up thereby, ensuring lower dropout rates. Our observations also indicate that the FFPE blocks collected from patients are either from different pathological laboratories or not well maintained by TNBC patients. Thus, this sample non-uniformity will create variability in the data collection envisaged for the TNBC BioBank. Clearly, these limitations can be overcome by continuous commitment to improving and standardizing the existing protocols for data collection, storage and retrieval[24, 25].

Table 2: Comparison of TNBC Radiological features with Literature[25]

FEATURE	LITERATURE REVIEW	CURRENT STUDY, % Distribution
Age	Younger age	>50% cases <50 years
Appearance	Masses (Common). Interval cancers common due to rapid growth.	Masses (96.8%)
Margins	Circumscribed, microlobulated margins (Common) Smooth /pushing border (rapid tumor growth and absence of infiltrating margin). TNBC mimic benign lesions leading to its delayed diagnosis.	Microlobulated (56.7%), Circumscribed (15%), Spiculated (5.9%)
Posterior Acoustic Features	Enhancement most common (like benign lesions). TNBC: Syncytial growth pattern (good propagation of ultrasonic waves). Non-TNBC : Trabecular growth pattern(shadowing)	Enhancement (70.6%)
Perilesional Halo	Absent. Echogenic halo seen (inflammation and desmoplastic reaction in ER, PR +ve tumors).	Absent (94.1%)
Micro-Calcifications	Rare. Low incidence of in situ stage, Rapid carcinogenesis leading to IDC status	Absent (80.6%)
Histo-Pathology	Grade III tumors most common	Grade III (46.2%), Grade II- (42.3%)

Nevertheless, the pilot version of this unique TNBC BioBank has shown promise for conducting hypothesis-driven translational research in Indian women. OBHC has undertaken efforts to populate the TNBC BioBank and radiology database with more cases from our clinic as well as from other BC diagnostic centres. The availability of well-curated Radiology database has enabled initiation of interesting collaborations with imaging scientists. These projects will be focused on the development of predictive machine learning based algorithms for comparing radiological features of TNBCs with other BC subtypes, non-cancer breast diseases or health breast tissue.

Furthermore, as part of its future BioBanking initiative, OBHC will expand its biospecimen collection by inclusion of FFPE blocks representing other BC subtypes as well as other biospecimens such as primary cancer tissue, blood, urine, saliva, DNA etc. It is interesting to note that the TNBC FFPE block collection

at OBHC has resulted in the genesis of collaborative research projects with like-minded BC translational researchers in India and abroad. We have initiated a project aimed at understanding the mutational hotspots in well-studied cancer-related genes from Indian TNBC patients. High-quality DNA isolated from tumour-rich regions of TNBC FFPE blocks in our BioBank is being subjected to next-generation sequencing (NGS)[24, 25]. Such study in Indian TNBCs has not been undertaken previously and is expected to reveal novel insights in TNBC biology. It is possible that identification of actionable mutations in molecular signalling pathways can pave the way for future anti-cancer drug discovery and development.

In conclusion, the pilot study aimed at creation of TNBC BioBank at OBHC has facilitated the creation of a novel repository of clinical data and biospecimens. This unique research database has generated a novel model for fostering multi-disciplinary research collaborations with like-minded scientists interested in BC research from India and abroad.

Ethical Clearance: No need

Source of Funding: Self

Conflict of Interest: Nil

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