International conference on Artificial Intelligence and Robotics

(ICAIR-2019)

Mumbai, India

23rd- 24th August 2019

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PREFACE

We cordially invite you to attend the ***International conference on Artificial Intelligence and Robotics (ICAIR-19)*** which will be held at ***Peninsula Grand Hotel, Mumbai, India*** on ***August 23rd-24th, 2019***. The main objective of ***ICAIR-19*** is to provide a platform for researchers, engineers, academicians as well as industrial professionals from all over the world to present their research results and development activities in relevant fields of Artificial Intelligence And Robotics. This conference will provide opportunities for the delegates to exchange new ideas and experience face to face, to establish business or research relationship and to find global partners for future collaboration.

These proceedings collect the up-to-date, comprehensive and worldwide state-of-art knowledge on cutting edge development of academia as well as industries. All accepted papers were subjected to strict peer-reviewing by a panel of expert referees. The papers have been selected for these proceedings because of their quality and the relevance to the conference. We hope these proceedings will not only provide the readers a broad overview of the latest research results but also will provide the readers a valuable summary and reference in these fields.

The conference is supported by many universities, research institutes and colleges. Many professors played an important role in the successful holding of the conference, so we would like to take this opportunity to express our sincere gratitude and highest respects to them. They have worked very hard in reviewing papers and making valuable suggestions for the authors to improve their work. We also would like to express our gratitude to the external reviewers, for providing extra help in the review process, and to the authors for contributing their research result to the conference.

Since May 2019, the Organizing Committees have received more than 62 manuscript papers, and the papers cover all the aspects in Engineering and Technology. Finally, after review, about 15 papers were included to the proceedings of ***ICAIR-19***

We would like to extend our appreciation to all participants in the conference for their great contribution to the success of ***ICAIR-19*** We would like to thank the keynote and individual speakers and all participating authors for their hard work and time. We also sincerely appreciate the work by the technical program committee and all reviewers, whose contributions made this conference possible. We would like to extend our thanks to all the referees for their constructive comments on all papers; especially, we would like to thank to organizing committee for their hard work.

ICAIR-19

Acknowledgement

IFERP is hosting the ***International conference on Artificial Intelligence and Robotics (ICAIR-19)*** this year in month of August. The main objective of ICAIR is to grant the amazing opportunity to learn about groundbreaking developments in modern industry, talk through difficult workplace scenarios with peers who experience the same pain points, and experience enormous growth and development as a professional. There will be no shortage of continuous networking opportunities and informational sessions. The sessions serve as an excellent opportunity to soak up information from widely respected experts. Connecting with fellow professionals and sharing the success stories of your firm is an excellent way to build relations and become known as a thought leader.

I express my hearty gratitude to all my Colleagues, staffs, Professors, reviewers and members of organizing committee for their hearty and dedicated support to make this conference successful. I am also thankful to all our delegates for their pain staking effort to travel such a long distance to attain this conference.

Ankit Rath
Chief Scientific Officer
Institute for Engineering Research and Publication (IFERP)

International conference on Artificial Intelligence and Robotics

(ICAIR-19)

Mumbai, India, August 23rd - 24th, 2019

Keynote Speaker

Dr. Mehran Sarkarati,

Head of Applications and Robotics Data Systems section

European Space Operations Centre of the European Space Agency, ESA.

Germany.

It is my pleasure to deliver a key note at the International conference on Artificial Intelligence and Robotics.

Operations of space missions require long and well-planned preparations, in order to ensure precise execution in a timely constrained environment to achieve mission success. It involves often collaborations among geographically distributed teams, with divided responsibilities for various elements of the space mission chain. Repetitive Simulations and training in representative environments as well as well- prepared and thoroughly validated operational procedures ensure smooth execution of such distributed operations.

In my key note, I will give an overview of a number of activities, which have been carried out in the recent years at the European Space Operation Centre in close collaboration with the European Astronaut Centre. These activities are related to preparation for future robotic exploration missions and surface operations. My talk will focus on the results of research and development activities, which have assessed applicability of advanced techniques for conducting distributed operations of multi-asset robotic missions.

I wish all participants of ICAIR-19, to a fruitful scientific exchange at various sessions. My thanks go to the organizing committee and best wishes for a high quality and enthusiastic conference.

ICAIR-19

International conference on Artificial Intelligence and Robotics

Mumbai, India, August 23rd - 24th, 2019

Organizing Committee

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CONTENTS

A Brief Review on Discourse Analysis

[1] Animesh R. Tayal, [2]S.R. Tandan, [3]M. A. Tayal
[1] Research Scholar, Department of computer science & Engineering, Dr. C.V.Raman University, Bilaspur (CG)
[2] Associate professor, Department of computer science & Engineering, Dr. C.V.Raman University, Bilaspur (CG)
[3] Assistant Professor, Department of Information Technology, Shri Ramdeobaba College of Engineering and Management, Nagpur (MH)

***Abstract*:-- We are living in the era of intelligent machines where everything is replacing by machine, interpretation of hidden meaning of text/speech becomes necessary to understands by machine. The last few years have seen an emergence of new perspectives in understanding the meaning of the given text. Researchers are working hard for this kind of complex problem. Discourse comes under this theme of understanding hidden information from the text. Syntactical and semantic analysis plays important role in discourse analysis. This paper focuses on the work done by various researchers in understanding discourse using various methods of machine learning and deep learning techniques.**

Index Terms: Discourse, Discourse Analysis

1. INTRODUCTION

Discourse is finding the hidden meaning from the piece of data we have. Discourse is defined by many researchers with different intent. Some more definitions are:
Discourse is "Language above the Sentence or above the Clause" (Stubbs, 1983).
Wikipedia depicts Discourse Analysis is a general term for a number of approaches to analyze sementically written, spoken, signed language as well as images also.
Discourse analysis is also concerned with language used in social platform, and in particular with interaction or communication between two persons. Discourse analysis is sometimes defined as the analysis of language 'Beyond The Sentence'. (Stubbs, 1983).

Discourse Analysis exists normally in the process of Natural Language Understanding. The words are analysed through morphological analysis and finds original word, then finds it appropriate tag using POS tagger. After having the syntax and semantic analysis discourse processing comes into the picture.

1.1 Influences on discourse analysis:

Following are the factors which influences Discourse analysis in broad sense. i.e. Sociolinguistics, psycholinguistics, computational linguistics, Pragmetics etc.

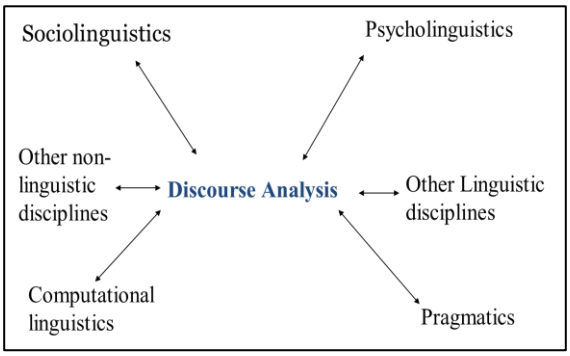

Figure 1. Factors which influences Discourse analysis

1.2 Discourse Analysis Levels:

We can analyse the different analysis levels of Discourse Analysis i.e. cohesion, coherence described below:

A. Cohesion Level (Textual Phenomenon)
Reference (It, this, that, his, her, him...etc.)
Ellipsis
Example:
The printer, I bought today doesn't work properly. It Surprised me.
I know that person. Do you?
It represent the grammatical relationship between sentences. It is essential to understand the exact meaning of sentences.

B. Coherence Level (Mental Phenomenon)
Example:
Her: It's the party time.
Him: Tomorrow having exam paper.
Her: Ok.
We can deduce that the above discussion with the assistance of straight action and by our contextual

information that someone who is having exam paper cannot come for the party.

1.3 Approaches of Discourse Analysis:

Many attempts have been made to understand the hidden information from the text. Researchers have applied this concept on many fields/areas. So, broadly, Discourse Analysis can be applied on various areas/ field, represents in Fig. 1.2.

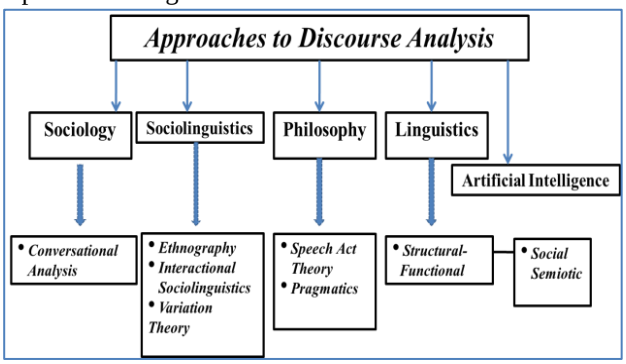

Figure. 1.2: Approaches to Discourse Analysis

II. REVIEW OF LITERATURE

A. "Discourse Structure and Computation: Past, Present and Future". (Bonnie Webber, 2012)

This work describes the discourse properties of text have extended been documented as serious to language technology, and over the past 40 years, our understanding of and capability to exploit the discourse possessions of text has grown up in several means. This paper demonstrates about many developments, technology, applications, support and the new challenges that each succeeding growth has elevated. (Bonnie Webber, 2012)

B. "CASCADE: Contextual Sarcasm Detection in Online Discussion Forums", (et.al D. H., 2018)

This work focuses on automatic sarcasm recognition which is based on lexical, syntactic and semantic level investigation of text. Background, common sense knowledge are some of the ingredients of sarcastic sentence. This paper, author suggest a ContextuAl SarCAsm DEtector (CASCADE), which accepts a mix method of content- and context-driven modelling. This was applied for online social media stuff. In the next phase this work extracts contextual information. CASCADE uses user embedding that encode stylometric and personality features of users as the sarcastic nature and form of expression can vary from person to person,. (et.al D. H., 2018)

C. **"The Penn Discourse Treebank",** (et.al E. M., 2004)

This work focuses on discourse-level annotation project – the Penn Discourse Treebank (PDTB) – those goals to produce a large-scale corpus in which discourse connectives are glossed, along with their arguments. The PDTB is being constructed straight on top of the Penn Treebank and Propbank, thus associate the mining of valuable syntactic and semantic features and providing a richer substrate for the development and evaluation of practical algorithms. (et.al E. M., 2004)

D. "Lexical and Discourse Analysis of Online Chat Dialog", (et.al E. N., 2007)

This work focuses on construction of a chat corpus, labelled with lexical (token part-of-speech labels), syntactic (post parse tree), and discourse (post classification) information. This corpus can then be used to grow additional complex, statistical-based NLP presentations that accomplish tasks such as entity identification, author profiling and social network analysis. (et.al E. N., 2007)

E. "Introduction to the Special Issue on Language in Social Media: Exploiting Discourse and Other Contextual Information", (et.al F. B., 2018)

This work focuses on Discourse information which pays to a deeper thoughtful of the part of these communications to method social media data from a new viewpoint in discourse understanding. This overview primarily delivers the essential contextual to understand what context is from both the linguistic and computational linguistic perspectives, and then gives the most current context-based methods to NLP for social media. In this paper, author conclude with highlighting what they believe are the future directions in processing social media texts. (et.al F. B., 2018)

F. "Understanding spoken discourse".(et al., Cornish 2014)

This work mainly emphases on spoken words, the current research on-going work is upon the Spoken discourse, located considerate of a speaker's talkative senses, in which the another speaker's expected and actual reactions are an integral part. The formation of discourse is thus a joint endeavour, joining the energetic association of all the members. The textual record on which this productive activity is based, in union with the invocation of a applicable context, is constituted not only by the verbal content of the utterances produced, but also by non-verbal signals.

G. "Discourse Analysis of User Forums in an Online Weight Loss Application", (et.al N. J., 1992)

This work focuses on initial investigation of language and discourse patterns in forum posts by users who lose weight and keep it off versus users with fluctuating weight dynamics. The result demonstrates polarity of sentiments; reveal differences the kinds of posts and semantic cohesion of posts made by users differ sideways with their weight loss design. This work is the first attempt of discourse-level analysis of linguistic and weight loss dynamics. Empirical Analysis done, which includes:

- Asking Questions
- Sentiment of Posts
- Cohesion with Previous Posts (Lydia Manikonda et.al, 2014)

H. "Textual Analysis of Print Media Text (et.al M. T., 2016)

In this paper the text is analysed for different types as well as linguistic formal structure in the newspapers language is also analysed. This work focuses on mainly political leaders, national politics, policy makers and the decision taken by leading politicians. This paper analysed the newspapers "The Nation" for the month of May and September. Following points are analysed:

The linguistic formal structure of media discourse. (et.al M. T., 2016)

The text kinds used in media discourse (open and close text)

I. "A Discourse Analysis of Software Documentation: Implications for the Profession" (et.al N. J., 1992)

This paper compares two best- selling books for word processing and spread sheet programs to determine the resemblances and modifications among prime and subordinate computer handbooks, and to account for the popularity of the secondary texts, to documentation provided by the producer. They created the revision by emerging experiential for investigative software documentation based on reasoning and oratorical values. Then applied the heuristic to the corporate documentation. When examined conferring to emotional aspects for operational documentation, the four sets of texts were similar they differed when analysed according to linguistic aspects. To support learning all the texts participate causes calculated. They use methods that inspire short- and long-term memory, appeal present work schemas, build new schemas, and create text processing easier. (et.al N. J., 1992)

J. "Annotating the discourse and dialogue structure of SMS message conversations" (et.al N. J., 1992)

In this paper author presented an outline for interpreting the discourse and discussion arrangement of SMS message discussions. The annotation specifications assimilate essentials of coherence-based discourse relations and communicative acts in conversational speech. Also present annotation experimentations that show reliable annotation can be achieved with this annotation framework. (al N. X., 2016)

K. "Discourse Annotation in the PDTB: The Next Generation", (et.al R. P., 2018)

In this paper author highlights from their work on enriching the Penn Discourse Treebank (PDTB), which has to be released to the community in fall 2018 as the PDTB-3. They have increased its coverage of discourse relations (from ⇠40K to ⇠53k), the majority in intra-sentential contexts. This work on these new relations has led them to augment and/or modify aspects of the annotation guidelines, including the sense hierarchy, and all changes have been propagated through the rest of the corpus. (et.al R. P., 2018)

L. "Adopting New IT by Learning in Groups: Results of Discourse Analysis", (et.al T. V., 2002)

This work was proposed to take place evolutionarily, containing pilots in diverse departments and appropriate feedback. After some duration the structure was positively accepted by one group of users but unsuccessful with alternative. This idea was invented by Beaufort Method. (et.al T. V., 2002)

M. "News clustering approach based on discourse text structure", (al T. M., 2015)

This paper presents a method to post-retrieval snippet gathering founded on design structures building on improved syntactic parse trees. Authors suggest a reduction technique that permits to build a reduced pattern assembly and create it accessible. In spite of how information is distributed between sentences, this algorithm takes into account discourse information to create clustering outcomes. (al T. M., 2015)

N. "Discourse Relations and Conjoined VPs: Automated Sense Recognition" (Valentina Pyatkin, 2017)

This work focuses on senses. The Logic identification of discourse relations is associated to shallow discourse parsing. Discourse relations can befall together crosswise sentences (inter-sentential) and inside sentences (intra-sentential), and more than one discourse relation can grip among the similar units. This paper demonstrated a consecutive classification system for their multi-label sense classification. It uses newly current corpus of discourse-annotated intra-sentential adjoined verb

phrases. The importance of each feature is assessed in the classification. (Valentina Pyatkin, 2017)

O. "An Analysis of Spoken Discourse between Two Native Speakers",
This paper first registers records and then evaluates a small extract from an English chat between two natural utterers. It goals to disclose that rules and features undoubtedly happen in people's daily dialogues. Though they are quick and passing, dialogues are more or less prepared and organized. For this reason, both language learners and teachers should lay stress on rules and meanings of verbal discourse. (Zhang, 2010)

P. "Toward Fast and Accurate Neural Discourse Segmentation", (Yizhong Wang et.al, 2018)
This paper proposes an end to end neural segmenter based on BiLSTMCRF framework. To advance its accuracy, they address the problem of data insufficiency by moving a word representation model that is trained on a huge corpus. They also suggest a limited self-attention mechanism in order to capture useful information within a neighbourhood. Experimentations on the RST-DT corpus show that this model is significantly earlier than preceding methods, while attaining new state of-the-art performance. (Yizhong Wang et.al, 2018)

Q."Improving STEM Classroom Culture: Discourse Analysis" (et.al Y. V., 2013)
This paper recommends that discourse analysis may assist as a device to improve trainers understanding of their classrooms and to assist as an involvement mainly useful for junior faculty as they are beginning their teaching career. In addition to this, it defines the theoretic basis of discourse analysis, determines its application, effectiveness applicability in STEM classrooms, Qualitative Methodology applied in three dissimilar courses. (et.al Y. V., 2013)

4. CONCLUSION:

According to the reviewed work of various authors, it is detected that discourse investigation is important for human machine interaction, machine intelligence, question answering system, etc. this may further lead to content generation from images. Proposed model will help to donate in examining text for its hidden sense.

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Review of Various Techniques for Evaluating Nodal Trust in Hierarchical WSN

[1] Prof. Aarti K. Naryani, [2]Prof. Rachana Deshmukh, [3]Prof. Rashmi Deshmukh
[1][2] G. H. Raisoni University, [3] Priyadarshini Indira Gandhi College of Engineering

***Abstract*:-- In today's modern world the wireless sensor networks have become a crucial tool to serve various purposes. The applications falling in range of wireless sensor networks are vast and tend to conquer our everyday life. It was initially designed for surveillance and monitoring for defense related operations but then it also proved to be boon for the health, traffic, consumer and industrial areas. Also, it is one of the most popular technologies for smart cities. However, the wireless sensor networks are highly prone to security attacks, and due to the dynamic, collective and collaborative behavior of sensor networks a secure data transfer has become a challenging task. The deployed sensor nodes, especially in the multi hop environment can get compromised and can behave maliciously. Therefore it becomes necessary to assess the trust worthiness or reliance of the sensor node over the other present in the network. Several researches have investigated various techniques for determining the nodal trust in WSN. This paper discusses the major challenges in wireless sensor network, potential attacks occurring due to compromised nodes along with the different types of trust models. It also figures out some of the existing trust models which are used in evaluating nodal trust in wireless sensor networks.**

Index Terms: Wireless sensor networks, trust model, compromised nodes, attacks.

1. INTRODUCTION

Wireless Sensor Networks (WSNs) have been recognized as one of the most important technologies for the twenty - first century [1]. Its distinguished characteristics, such as remote and denser level of node deployment, high degree of unreliability of sensor nodes, severe energy computation, and storage limitations makes it different from traditional wireless communication networks, such as, cellular systems and MANET i.e. mobile ad hoc networks. This however, introduces the different set of challenges in the development and application of WSNs. The Fig I show the structure of a typical sensor node. In the past decade, looking to the popularity of WSNs, it had become the favorite topic all over the globe both in the field of industry and academia. Various researches have been carried out to traverse and solve various issues related to design and application of WSN. Significant advances have been made in the remote deployment and development of WS nodes.

In the near future WSNs will be widely used in various domestic and military fields, and transform the way we perform the usual activities in the physical world.

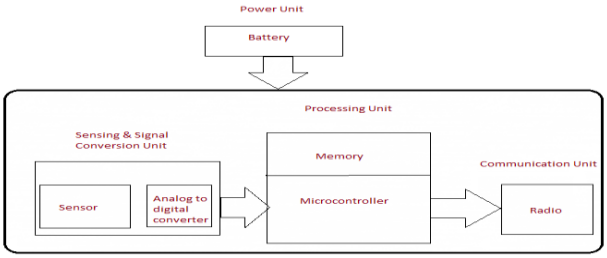

Fig I. The structure of the typical sensor node

II. WIRELESS SENSOR NETWORK CHALLENGES

The WSNs possesses the unique network characteristics. The- refore, the design of WSN presents many challenges, which
covers the following main aspects:

• Energy Constraints: Sensor nodes are battery operated and lack the automatic recharging capability. Data collection [3], processing and communication, continuous listening to the medium for packet receiving and transfer everything requires large amount of energy.

•Limited Hardware and Software Resources: It has limited processing and storage capacities, and thus can only perform limited computational functionalities [4].

• Massive and Random Deployment: The sensor nodes are deployed remotely and are expected to autonomously organize, configure, adapt, maintain and repair themselves [5] in a hostile environment.

• Dynamic and Unreliable Environment: The network connectivity between the sensor nodes may be frequently

disrupted because of channel fading or signal attenuation [1].

• Security: Security services have been provided such as Link-layer encryption and authentication, Identity verification, Bidirectional link verification, etc. but the specific technique cannot resist all types of attacks [6].

• Diverse Applications: It is difficult to build a protocol which can fulfil all the requirements of all the applications, since the design of sensor networks is application specific. The new middleware for WSNs, called Motley middleware [10], have made it possible to some extend to support diverse applications in shared infrastructure environment of WSNs.

III. MOTIVATION FOR TRUST MANAGEMENT IN WSN

From the above mentioned challenges one can determine the level of unpredictable environment of sensor networks. This gives attackers the very chance to perform anonymous changes in sensor nodes. Trust of a sensor node is one of the most important categories of Intrusion Detection System in WSN [2]. There are basically, two types of nodes in the network- trustworthy nodes and untrustworthy nodes. The trustworthy nodes forward the network traffic towards the destination node dedicatedly, sincerely and cooperatively. On the other hand, untrustworthy nodes are the compromised node. A compromised node is a node which after remote deployment of sensor nodes may exhibit unpredictable behavior and may cooperate in a secret or unlawful way with other compromised nodes in order to gain an advantage over others trustworthy nodes present in the network [7]. Generally node compromise occurs when an intruder captures a node, and then that is directly connected to their machine through a wired or wireless connection. Then, the original programming of that node is replaced with some sort of destructive programming and then that node is set in the network with other sensor nodes as it was previously. This node can be used by the attacker to launch more serious attacks. The untrustworthy node act according to the instructions provided by the intruder and thus behaves very suspiciously, maliciously and selfishly. It may direct the traffic to the adversary node or flood the packets by creating too much duplication or modify the contents of the message. Several widely known attacks like wormhole, Sybil, black hole, gray hole, DoS, replay etc [8] target the nodes thereby destroying the complete network.

IV. NODE COMPROMISE POTENTIAL ATTACKS

In the following section, Table I attempts to list as many attacks as possible that may occur due to node compromise.

A. Trust Model

The trust model supports the trustworthy nodes to communicate among them and discourages untrustworthy nodes to participate in the network activities. Using trust models one can obtain the trust related information which can define each node's trustworthiness. The network lifetime, toughness and throughput depend on number of trustworthy nodes present in the network. A trust model plays important role not only in the higher level of decisions such as routing [22] and data aggregation [23], but also cluster head election and, and key distribution [24]. Trust model performs network monitoring activities thereby increasing the security. Also, it minimizes the risk and ensures good performance of activities such as data gathering and data processing [25]. In this paper, we surveyed and examined the already proposed trust models and studied their advantages and disadvantages. Our purpose is to enlist useful guidelines for the design of trust models that can be implemented in real-life applications.

The trust models can be distinguished in three categories centralized, hierarchical and distributed [26] depending on which node in the remotely deployed sensor network carries out the responsibility of evaluating and analyzing the trust values of other nodes. In the centralized case [27], the sink node or the head node is considered to be the most trusted node and it is responsible for examining the trustworthiness of its surrounded sensor nodes. The trust values are calculated on the basis of the parameters values collected by sink node on its own, or values received by all or specific nodes in the deployed sensor network. This head node then broadcasts these trust values in the network so that the nodes can use it to make their decisions. The advantage of announcing the trust values to network is that there individual node need not be equipped with this functionality. But then this comes with two severe disadvantages. First, percolating the trust information in the network needs extra energy consumption and second, trust information is with individual node if this node is compromised then it could lead to severe network disruption. Centralized trust model fails in case of denser sensor nodes deployment and resource limitations. The hierarchical trust model [28] overcomes the limitations of centralized trust model.

In hierarchical trust model, there are group of clusters and each cluster has Cluster Head (CH) which takes the responsibility of computing the trust of nodes in its kingdom. In distributed nodal trust each node is monitoring all its neighboring nodes and individual nodes assess the trustworthiness of its neighbors. This forms a distributed trust architecture [29].

V. RELATED WORK

A. Determining Nodal Trust in Hierarchical WSN

The table (Table III) lists various techniques presented by different researchers for evaluating the trustworthiness of the sensor node in hierarchical environment.

In paper [30], the researcher Idris M. Atakli proposed a weighted-trust evaluation (WTE) based scheme in order to identify the compromised nodes in hierarchical WSN by observing its reported data. This paper tries to identify mischievous node in spite of the so called Byzantine problem [30]. The Forwarding node aggregates the data send by the sensor nodes. Here, each sensor node is assigned weight W. The weight of each sensor node is likely to be decreased if it frequently sends the information that is conflicting with the final decision. Finally, the node is detected as the malicious node as its weight goes down the specific weight. With respect to the mismatch among response time, detection and mis-detection rates, the weight penalties are also introduced.

In research [31], the sensor nodes are organized into number of clusters allocating each cluster with the cluster head. The trust values are calculated when it is requested. Each sensor node is assessed by its cluster head on the basis of the report submitted by its neighboring nodes for the trust values and similarly, each cluster head is assessed by the base station on the basis of the report submitted by its neighboring cluster heads. The trust values are calculated on the basis of two factors QoS (Quality of Service) trust metrics (energy, unselfishness) and social trust metrics (honesty, intimacy). The trust values of sensor nodes are calculated on demand from CH and BS. The trust values in this paper are calculated same as HTM [35].

In another research [32], the trust management architecture for hierarchical WSN is proposed which evaluates the nodal trust with reduced computation and communication requirements. Here, all sensor nodes and the CH nodes are assumed to be static or motionless. Also, the physical locality and range of communication of all nodes is assumed to be known in the network. In this, the concept of direct, indirect and integrated trust is introduced along with the sponsor and target nodes. According to the paper, the sponsor node selects the target node on the basis of direct trust value of target node. The CH decides the group trust value on the basis of the trust values sent by individual sensor nodes of other nodes in the cluster. The trust information is calculated at various levels like cluster head level, intra and inter cluster heads level along with sponsor and target nodes trust levels.

Attack		Description
Routing loop attacks		In this attack, the malicious nodes completely modify the routed packets so that packets enter a sort of loop (cycle) and could not reach the predetermined destination [9].
Wormhole attacks		In this type, a secret route is established by the attacker between two distant places by compromising the group of destructive nodes and then the packet is diverted through that established channel [1][10].
Selective Forwarding	Grayhole	In this type of attack, the destructive nodes disallow the packets to pass through the in the network
	Blackhole	Black hole attack which is very complex to detect and defend. In this, an attacker gains the control of the sensor node(s) and re-programs them in order to block the data packets they receive and disallow them from forwarding to the intended destination [11].
	DoS attacks	In this type of attack, the intruder aims at making the machine or a complete network resource unuseful and unavailable to its predetermined users by temporarily or indefinitely discontinuing services of a server connected to the Internet [12].
Sinkhole attack		In this type of attack the malicious node pretends itself to be the most attractive one in terms of probably having a good trust level and a node having the tiny distance to the base station. In this way, by drawing attention of other nodes and by advertising itself, it takes part in the routing process and try to draw as many packets from this path as possible[12].
False information or		The group of destructive node may work together to provide wrong information against the

false recommendation		trustworthy nodes in order to spoil their reputation. Same happens in *stacking attack*, where the malicious nodes keep spreading false information about a peer node and create its negative reputation [13].
Incomplete information		A destructive node provides the improper and incomplete information. It always tends to mislead other nodes [11].
Packet modification/insertion		In this, the destructive node tries to modify the contents of the packet. Also inserts compromised packets with incorrect routing information in the network [15].
Sybil attacks		It is an attack in which multiple identities from same malicious node is created. This attack is very dangerous for WSN as it can act as the gateway for any other attacks such as wormhole, sinkhole, selective forwarding etc [17].
Blackmailing		A compromised node can blackmail another node by circulating wrong information that another node is mischievous or malicious. This generates chaos in the network and disrupts the normal functioning of the whole network [18].
Replay attacks		This attack aims at sending outdated information in the network which can cause many problems [19]. An attacker captures a packet from a network, hold it for indefinite amount of time, and then send it into the network.
Selective misbehav-ing attacks	On-off attacks	In this, the malicious node behaves very unpredictably. Like it sometimes shows very good and cooperative behavior or sometimes behaves selfishly just to remain unidentified and undetected from its malicious activities [20].
	Conflicting behavior attacks	A destructive node behaves in different ways with different groups in the network and makes different opinions about other thus creating conflicts and groupism in the network ultimately resulting in the non-trusted relationships [21].
False Reports		Not every node in the network can send the data directly to the base station in order to avoid energy waste. So few nodes take the responsibility of aggregating the data from all nodes and clubbing that data by the process called data fusion and then generating the final report and transmitting a single report to the base station. However, if some malicious nodes get involved in the data fusion process then false report will be sent to the BS.

Table I. Potential attacks occurring due to node compromise

Riaz Ahmed Sheikh, in his research paper [33] stated a new lightweight technique called Group-Based Trust Management Scheme (GTMS) for Clustered Wireless Sensor Networks. It is an intrusion tolerant technique that helps in detecting and preventing malicious, selfish, and faulty nodes by using hybrid trust management approach. GTMS calculates the trust value based on direct or indirect observations. The trust is calculated at three different levels-node level, Cluster level and Base station level. In this, it is assumed that all SNs have typical unique identities like location, node type, and node subtype. The research paper proposes a trust model which works with two different topologies intragroup & intergroup.

In yet another research work proposed (HTECH) [34], an efficient method of selection of CH based on trust routing is demonstrated. Trust Design process considers four components such as node unselfishness, Node Cooperativeness, Node Honest and Node Data Transmission Rate on the basis of which the trust is evaluated. The cluster head is selected on the basis of Trust value. According to the author, this protocol performs ideally in terms decrease in delay and delivery rate.

In [35], considers two factors for assessing trustworthiness, namely social trust and QoS trust. It is a probability model using stochastic Petri nets techniques which analyzes the protocol performance with respect to its quantities, and validating subjective trust against objective trust calculated based on actual status of nodes.

TBHR Protocol for WSN [36], is concerned with the energy conservation of the network. It is basically designed for multi-hop hierarchical wireless sensor network. It evaluates the trust value for individual sensor node in the n/w on the basis of the components derived from communication and social networks. In this paper, the residual energy or leftover energy of the node and its number of negotiations with the neighbors and CH are considered as the basis for trust evaluation.

The following table (Table II) elaborates in general the merits and demerits of the above described nodal trust technologies

Technique Used	Merits	Demerits
WEIGHTED TRUST EVALUATION TECHNOLOGY [30]	-It is easier and less complicated to keep track of the nodes and it is difficult to gain control over most of the node unless an attacker gains control of the base stations. -This approach is best suited for small and dense sensor networks.	-The whole system will fail if the BS itself gets compromised. -If the quantity of the compromised nodes leads the legal nodes, then the legal nodes will be reported as malicious.
RHTM [31]	-It calculates the trust values of Sensor nodes and CH on request only thereby reduces the energy consumption rate of sensor nodes.	This scheme cannot identify those types of attacks in which the attackers gives false recommend - ations about the other nodes but then forwards the packet correctly
TMA [32]	- Suitable for aggressive node movement and multi-hop routing - It uses timing window and a decay function in order to assess the changing behavior of trust in trust calculations.	Static assumptions are made
GTMS [33]	- Reduces the cost of trust evaluation - Suitable for large scale networks	-Memory overhead for Nodes is more compared to TMA - Not suitable for dynamic node movement and multi-hop routing
HTECH [34] & HTM [35]	- As per the simulation results HTECH decreases both packet loss rate, delay rate, and improves output of SNs and shows Performance close to the expected performance with regards to energy consumption. - HTM Shows expected performance level that is achievable by routing based on flooding in message delivery ratio and out performs the traditional routing protocols that do not make use of trust concept in selective forwarding of nodes in message delivery.	-
TBHR [36]	-Improves network lifetime by allowing more number of nodes to take part in transmission to achieve stability in energy in the nodes. -Results indicate that it performs around 10 % better than TBGR scheme with respect to network lifetime and approx. 5% better than AODV protocol when packet delivery ratio is considered.	-In this, the end-to-end delay in when packet is forwarded from S to D in the network is more.

Table II. Merits and Demerits of different nodal trust evaluating hierarchical WSN Techniques

VI. COMPARATIVE ANALYSIS OF HIERARCHICAL TECHNIQUES

The comparative analysis of Hierarchical nodal trust techniques described above is discussed in the following table (Table III).

Specification	RHTM	TMA	GTMS	WTE	HTECH	HTM	TBHR
Calculation of trust value of nodes	On Demand	Recorded	Recorded	Recorded	Recorded	Static	Static
Energy Consumption Consideration	Yes(Consumes 6K J in 100 sec	Yes	Yes (Consumes 10K J in 100 sec)	No	9.5J residual energy is left after 50ms	Yes (Consumes 8K J in 100 sec)	Yes (Amount of residual energy left is

							considered)
Node Movements	Static	Dynamic	Static	Static	Static	Static	Static
Communication overhead consideration	No	Yes	Yes	Yes	No	Yes	No
Storage overhead consideration	No	Yes	Yes	Yes	No	Yes	No
Memory overhead consideration	No	No	Yes	Yes	No	Yes	No
Computation overhead consideration	No	Yes	No	No	No	Yes	No
Trust Decay consideration	No	Yes	Yes	No	No	Yes	Yes

Table III. Comparative analysis of various hierarchical techniques

CONCLUSION

This paper extensively discusses the major challenges and the potential attacks that can occur in WSN due to sensor node compromise. Many researchers have proposed several techniques and mechanisms to cope up with the severe vulnerabilities caused due to malicious node in WSN. This paper tried to explore the researches done in the field of detecting and isolating the compromised nodes causing danger to the network. This can be helpful to the researchers who are working on node compromise attacks either in centralized or hierarchical wireless sensor network.

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Effective Classroom Monitoring by Facial Expression Recognition and Ensemble Learning

[1] Dr. Seema Kolkur, [2] Sourish Vaghulade,[3]Gaurav Tejwani,[4] Yash Vazirani
[1][2][3][4] Dept of Comp Engg,Thadomal Shahani Engineering College,Mumbai, India

Abstract:-- **Face Detection and Recognition of facial expressions is crucial to many applications in real time. A great deal of improvement is made in these areas due to recent concepts of deep learning and abundant datasets available online. The purpose of this paper is to propose a deep learning model along with ensemble learning to further improve the results of face detection and recognition system . Mere presence of a student in a classroom does not merit his/her attention towards the material taught in it. So, the trained model is further extended to a full-fledged classroom monitoring system which can help both students and teachers for effective teaching learning process. The system can recognize students facial expression and based on that can determine how long each student was focusing in class. Also the system can automatically mark a student present in a class. Our system delivers promising results.**

Index Terms: Deep Learning, Ensemble Learning, Expression Analysis, Face Recognition

1. INTRODUCTION

Facial Expression Recognition (FER) is an important process for humans to facilitate understanding, communication and analysis. It consists of locating faces in the scene (object recognition), extracting useful features from the detected face regions, analyzing and classifying the features into different categories [1]. There are numerous applications of expression recognition in Medicine, E-learning, Monitoring, Entertainment, Law, Marketing, etc [2]. Today Deep Learning is widely used for image classification problems. Convolutional Neural Network (CNN) and transfer learning techniques together have delivered fantastic results in many applications. We used Ensemble Learning along with deep architectures of CNN to further improve the results. We apply the resultant model for effective classroom monitoring.

II. STATE OF THE ART

A Facial expression recognition system typically performs following subtasks [3].

A. Face Detection

Various methods have been proposed in literature for face identification. In the case of static images, the most commonly used technique is called Viola-Jones, which achieves fast and reliable detection for frontal faces [4]. Among other localization techniques, there is a neural network-based face detection solution by Rowley et al [5] and a statistical method for 3D object detection applied to faces and cars, by Schneiderman[6].

Face tracking in image sequences uses other types of approaches, which rely on constructing 3D face models. Some popular examples are the 3D Candide face model [7] and Piecewise Bezier Volume Deformation tracker (PBVD) [8]

B. Feature Extraction Algorithms

The next and most important step is feature extraction, which can determine the performance, efficiency and scalability of the system. The main goal is mapping the face pixels into a higher-level representation, in order to capture the most relevant properties of the image and reduce the dimension of data.

There are three types of approaches that appear in the literature, which depend on data and the goal of the system.

1. Geometric or feature based techniques

These are concerned with identifying specific areas or landmarks of the face. These methods are computationally more expensive, but these can also be more robust and accurate, especially if there is variation in size or orientation. An example would be Active Shape Models, also known as ASM, which is popular for face and medical imaging applications. These statistical models learn the shape of objects and iteratively get adjusted on a new one (face). However, they can be highly sensitive to image brightness or noise. Improved results are achieved with Appearance Active Models (AAM), a more elaborated version of ASM which also incorporates texture information for building an object model.

2. Appearance or holistic methods
These methods do not treat the face as individual parts, but analyses the face as a whole. One of the most popular algorithms in the literature is the Gabor Wavelets, which can achieve excellent results in recognizing facial expressions. An interesting system developed by Bartlett et al in 2003 [9] uses this method and it has been deployed on several platforms. A major downside for real-time applications is the high computational complexity and memory storage, even though it is usually combined with a dimension reduction technique. An alternative approach, originally used for texture analysis but which recently gained popularity in the current context, is Local Binary Patterns (LBP)[11]. This technique has a great advantage in terms of time complexity while exhibiting high discriminating capabilities and tolerance against illumination changes. Either Eigenfaces or Fisherfaces are used for higher level representation in face recognition algorithms. LBPH algorithm tries to find the local structure of an image, by comparing each pixel with its neighboring pixels.

3. Hybrid techniques
These are perhaps the best in tackling feature extraction, which consists of a combination of the previous methods. Geometric procedures such as AAM are being used for automatic identification of important facial areas on which holistic methods, such as LBP, are applied.

C) Classification Algorithms
Once the features are detected, the given face needs to be classified as belonging to one of the pre-defined expression classes. There is a large variety of classifiers that are used in literature and choosing which one to use depends on criteria, such as type and size of data, computational complexity, the importance of robustness and overall outcome. One of the most popular methods is Support Vector Machines, greatly used for their results and high generalization capabilities, but suited for binary classification problems. Alternatively, powerful, flexible and capable of training complex functions are Artificial Neural Networks, which are also naturally multi-class algorithms, or Random Forests. Cohen et al. [11] suggest using dynamic classifiers, such as Hidden Markov Models. This method is proposed for person-dependent systems, as it is more sensitive to temporal pattern changes, in the case of videos.

Recently CNNs are successfully utilized for feature extraction and inference FER ([13]– [18]). We used the concept of ensemble learning [5] along with deep networks to further improve the expression recognition results. Instead of using a single CNN model two similar CNN models are used, one working on original image and other on mirrored image. We also applied the trained model for the effective classroom monitoring.

III. METHODOLOGY

A. Dataset
FER2013 is a large, publicly available FER dataset consisting of 35,887 face crops [19]. All images are grayscale and have a resolution of 48 by 48 pixels (Fig.1). These are divided in different categories namely anger, disgust, fear, happiness, sadness, surprise, as well as neutral. The dataset is challenging as the depicted faces vary significantly in terms of person age, face pose, and other factors reflecting realistic conditions. The dataset is split into training, and test sets with 70:30 ratio respectively. Basic expression labels are provided for all samples. The human accuracy on this dataset is around 65.5%. Only 5 of the 7 expression classes have been used due to lack of sufficient images for the excluded 2 classes. Image distribution for these 5 expression classes is as indicated in the table 1.

Fig. 1 Example faces in FER2013

Table 1. Image dataset

Emotions	No. of images (48x48)
Neutral	6198
Happy	8988
Sad	6077
Angry	4759
Surprise	4002
Total	**30024**

B. Model Architecture
Fig. 2 shows the architecture of deep network model used. The resultant model is ensemble of two similar models applied to an original image and it's mirrored image. Final prediction is made by concatenating results of two. As it can be noted four layers of convolution

layers are used with different filter sizes, ReLU activation function and batch normalization. Max pooling of size 2*2 is used after the second and third layer. This arrangement is followed by 3 dense layers. Same set of layers are stacked in a model working on a mirror image. As there are 5 emotion classes last layer is a softmax layer of size 5. A dropout of 0.25 is used after some layers to avoid over-fitting.

We got accuracy of 70% on FER13 test dataset as shown by confusion matrix in fig. 3. Some results from the test dataset are depicted in fig. 4 along with the label predicted.

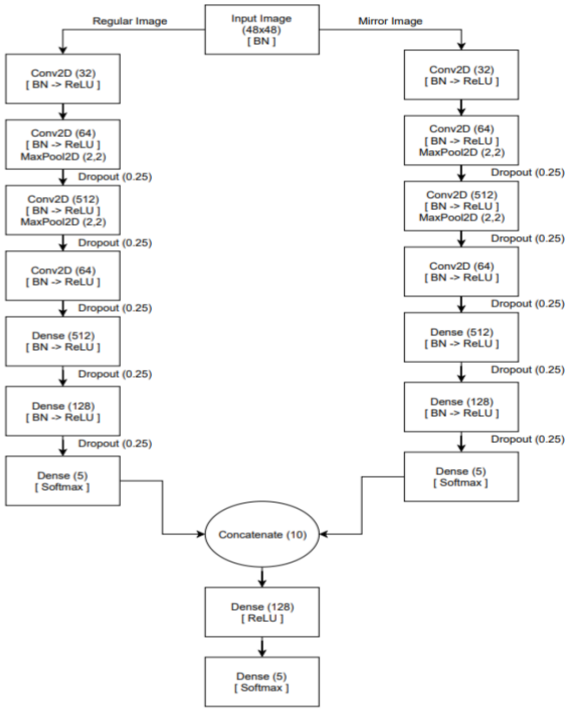

Fig. 2 Architecture of model network

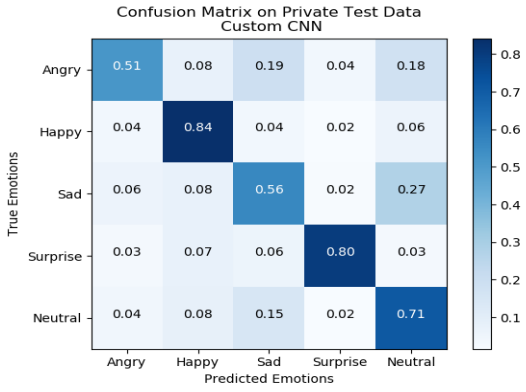

Fig 3. Confusion Matrix for Custom CNN

Fig 4. Result of Custom CNN on FER2013 dataset

IV. EFFECTIVE CLASSROOM MONITORING

Mere presence of a student in a classroom does not merit his/her attention towards the material taught in it. A Chinese school (Hangzhou Number 11 High School) uses facial recognition technology to monitor how attentive students are in class [20]. A good monitoring system helps students to be more attentive, teachers more adaptive, and derive various meaningful insights using data analysis.

We extended our trained model into complete monitoring system with a simple architecture as shown in fig. 5.

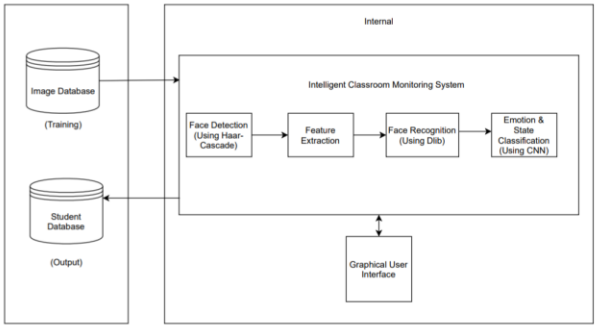

Fig 5. Proposed Monitoring System Architecture

The system mainly focuses on the recognition of human expressions and assigning the respective state the student is in(focused/distracted) and to identity the student (from student database). This is done using a webcam or an external camera. The user initiates the monitoring process by click of a button on the GUI which starts collecting data from single or multiple cameras pointed away from the user towards the classroom. The live feed of the camera will be visible on a bigger device like a laptop/desktop on which the predictions are being made. This feed is broken down frame by frame and passed through the pipeline of trained algorithms which in turn detect the faces of the students along with their identities, expressions and states. To detect a face from every feed Haar Cascade is used [4].

A student is assumed to be 'focused' if the expression is neutral for predefined some time. Other facial expressions are considered to be 'distracted' for the

student. Based on the presence of a student's image on screen the system calculates his/her attendance.

The system identifies different facial expressions for the students, and that information is then fed into a computer which assesses if they are enjoying lessons or if their minds are wandering. If it concludes that the student is distracted with other thoughts during class, it will send a notification to the teacher to take action.

Some results of real time classroom monitoring are displayed in fig. 6. As can be found the system correctly detects faces of all students and captures their emotions.

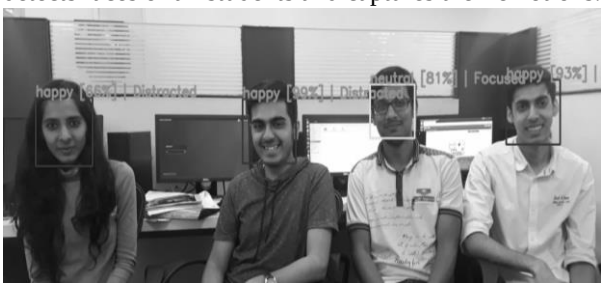

Fig 6. Real time result of proposed model

V. CONCLUSION

This paper proposes a system for facial expression recognition involving the domains of computer vision and machine learning. The facial expression of a student, after being captured, goes through multiple stages of processing such as face detection, feature extraction, and classification. The knowledge obtained can be used for effective classroom management. The system displays student's identity along with the time he/she was focused in the class. It also calculates attendance of the student in a class.

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Face Recognition using CNN for Unconstrained Biometrics with Misalignment Covariate

[1] Nilesh Pawar, [2] D.T.Ingole, [3] M.D.Ingole
[1] Assistant Professor, ETC Department, Saraswati Education Society, Kajrat, Raigad
[2] Director of innovation, incubation and linkajes, Prof.Ram Meghe Institute of Technology & Research
[3] Professor, Dept of ETC , Prof.Ram Meghe Institute of Technology & Research

Abstract:-- **Face Recognition is an important basic primitive for various applications and fields such as threat detection, immigration, educational institutions, video analysis & surveillance, sport and biometrics etc. In face recognition, face detection is first step to find out the region of face and this step suffers from variations while determining bounding box for face. This leads to the misalignment in face regions across the samples of intra-class and inter-class faces. In this paper, we have proposed to use convolutional neural network (CNN) to overcome this issue. CNN is a one of popular technique of deep learning. We compared proposed approach of generating training samples to be included in training of CNN such that it improves the recognition accuracy significantly as compared to the one when only original training samples are used in training.**

1. INTRODUCTION

Identifying a person based upon physical and behavioral attributes is the basic working principle of biometric recognition or biometrics. It is a field evolving briskly with wide range of applications involving computer access to bank transactions. Deploying such biometric systems in both government and private applications on large scale will definitely increase public awareness about biometric systems. The three commonly used modalities in the biometrics field are fingerprint, face, and iris. Few other modalities like hand geometry, ear, and gait are also in existence along with advanced topics such as multi-biometric systems and security of biometric systems.

Biometrics identity is used to identify and authenticate a person to grant accesses and controls. It is also used to isolate an individual from a crowd that is under surveillance. Biometric identifiers are the unique, computable features used to tag and designate people. Biometric identifiers basically have two categories, physiological and behavioral. Face recognition is a technique to identify an individual with the virtue his/her face. In this technique an image or video of a person is compared with the data present in the database and then the relative identification of that person is made. In order to make the comparison meaningful and infallible the projecting features of human face like the shape, structure and proportions, distance between the eyes, nose, mouth and jaw, the sides of the mouth, upper outlines of the eye sockets, the area surrounding the check bones and location of the nose and eyes are taken into consideration.

Among many biometric traits, fingerprint, face and iris, have been successfully applied to person verification and identification based applications such as person's verification in highly restricted or public areas, attendance system in office premises and forensics. There is huge demand for new applications where biometrics can play vital role as mentioned in [17]. Three factors are very important to consider for any of the biometrics system: scale, usability and accuracy [18]. Thus, ideal system would like to have extreme ends of axes of these three factors. There are two types of broad categories of biometric systems, controlled biometrics (traditional) and non-cooperative biometrics (unconstrained). In traditional biometrics systems, the user is made to cooperate with system and submit a biometric in a highly controlled manner by facing front and standing still [1]. On the contrary, in non-cooperative biometrics system, subject of interest is far from sensor and moving, allowing user not to get disturbed by identification process. In unconstrained biometrics, face can be good candidate to identify. In this paper, we have proposed to use convolutional neural network (CNN) to overcome this issue. CNN is a one of popular technique of deep learning. We compared proposed approach of generating training samples to be included in training of CNN such that it improves the recognition accuracy significantly as compared to the one when only original training samples are used in training. The remaining part of the paper is as follows. In next section 2, related work has been briefly presented. The proposed method is briefly explained in section 3. The experimental results and discussion are reported in section 4 and finally the

paper is concluded with highlighting the inferences from experimental observation in section 5.

2 | RELATED WORK

This new alignment method led to most significant improvements, especially since in unconstrained biometrics gaze variations are more prone to happening. This work is very much useful to be considered in unconstraint biometrics since the pedestrian samples used in experiments are similar to those will appear in unconstraint biometrics.

Until 2015, face recognition problem has been treated with two stages, namely, feature extraction and then, classification. Feature extracted could be global representation like PCA [1,7] and LDA [2,3,4], or could be local like SIFT [5,6], wavelet network [8,9] using each of the landmark localization [10,11] . Later, faces also represented as semi-local feature extraction using blocks of face images as in case of HOG, LBP based face or object recognition. These methods were later proved to be inefficient in large number of samples training.

In 2012, Alex Net was proposed by A. Krizhevsky [12], which got the first of the ILSVRC 2012 on classification task. .Deep ID series [13, 14, 15] and other algorithms have achieved excellent performance in face recognition. These models are trained on large-scale datasets, and the network architecture is complex. To overcome this issue, Xiang Wu proposed Light CNN [16] in 2015. Light CNN model has four convolution layers and it obtains 97.77% on LFW. Light CNN model B has five convolution layers which obtains 98.13% on LFW.

3 | METHODOLOGY

Face recognition is very complex problem assuming variety of subjects in different situations with various protocols of data acquisition. The main covariates such as non-uniform illumination, varied pose angles of subjects are dominant factors in unconstrained biometrics. Additionally, misalignment is also an intrinsic covariate because of which performance of face recognition degrades significantly. Misalignment happens due to the non-ideal performance in practical face detector. In most of situations of biometrics applications, there are limitations of training samples that can be captured at the time of enrollment from each of the subjects. The conventional techniques of classification such as k-NN, SVM along with feature representation, are suitable for less number of training samples. However, these techniques are not that robust where test samples include covariates of misalignment.

To these kinds of problems, deep learning provides a very efficient way to handle misalignment, also they have capabilities to absorb large number of training samples and make training more meaningful. CNN architecture of deep learning is good for image classification problem. The CNN model for image recognition problem consist of many two operations, 1) Convolution and 2) Pooling.

The figure.1.a shows the baseline approach for face recognition using CNN. The original samples are used for training the CNN model. Further, we propose then approach where training samples and their augmented versions of samples are used in training as shown in figure 1.b.This approach requires same number of original samples as that in baseline approach. The augmented samples from original ones are generated using criteria of rotations, scaling. This ensures more covariates to include in gallery samples, so that trained model can handle samples with more variations in probe samples.

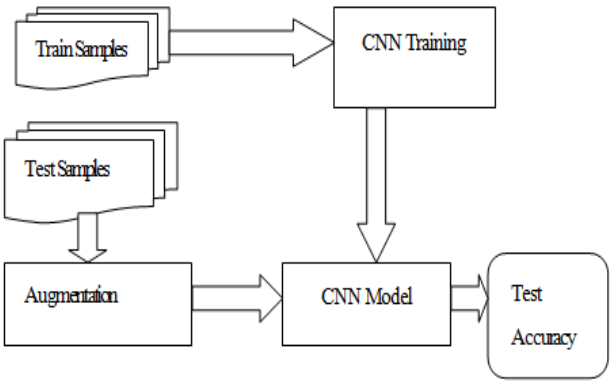

FIGURE 1a) Baseline Approach for training CNN model

The proposed approach uses 6 frontal samples from one of the session and their augmented version of images. This approach ensures there are enough samples for training the CNN model of face recognition.

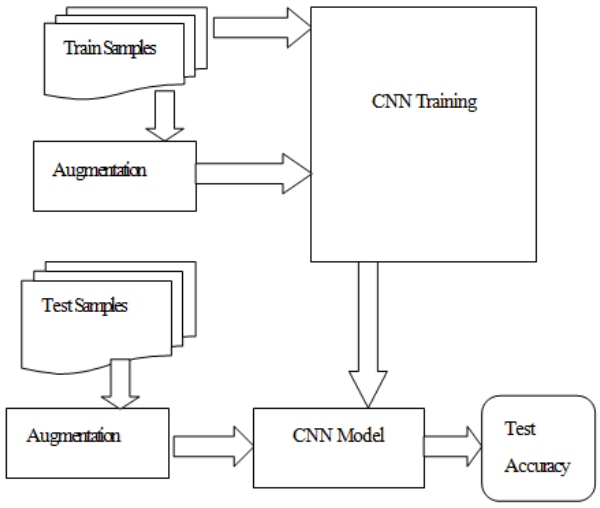

FIGURE 1 b) Proposed Approach using Augmented Samples in CNN

4 | EXPERIMENTAL RESULTS & DISCUSSION

We have analyzed the effectiveness of our proposed approach. The face dataset used in [19] has been employed in our experiments of face recognition. This dataset has varied pose angles structured across the 85 subjects. We have used few subjects for validating our hypothesis that training using augmented samples will boost the face recognition accuracy as compared to when only original samples are used for training. The methodologies are explained in detail in previous section. In the baseline approach, we used 6 frontal samples from one of the session. We tested on augmented samples of remaining frontal and posed angles samples. This ensures the testing is happening on the much-like unconstrained situation where face detection stage gives misaligned face boxes.

5 | CONCLUSION AND FUTURE WORK

Face recognition is an important basic primitive for various applications and fields such as threat detection, immigration, educational institutions, video analysis & surveillance, sport and biometrics etc. In face recognition, face detection is first step to find out the region of face and this step suffers from variations while determining bounding box for face. This leads to the misalignment in face regions across the samples of intra-class and inter-class faces. In this paper, we have proposed to use convolutional neural network (CNN) to overcome this issue. CNN is a one of popular technique of deep learning. We compared proposed approach of generating training samples to be included in training of CNN such that it improves the recognition accuracy significantly as compared to the one when only original training samples are used in training.

Table 1 shows the comparison of Baseline and Augmented approach for training and testing samples. We found recognition accuracy has a significant rise from 40 in baseline to 49 in augmented approach in training and testing samples

TABLE 1 Comparison for baseline and proposed approach with recognition accuracy.

Method Training Testing Recognition Accuracy

TABLE 1 Comparison for baseline and proposed approach with recognition accuracy.

Method	Training		Testing		Recognition Accuracy
	Types	# Samples	Types	# Samples	
Baseline	Train Original	30	Augmented of Test Samples	5924	40
Augmented Training	Train Original + Augmented	5612	Augmented Test Samples	5924	49

Figure 2 shows the samples with all pose angles for one person

FIGURE 2.Dataset Image samples for one person showing variation in illumination and pose angle

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Smart Parking Guidance System Using 360o Camera and Haar-Cascade Classifier on IoT System

[1] Salma, [2] Rashidah Funke Olanrewaju, [3] Khaizuran Abdullah
[1][2][3] Electrical and Computer Engineering, International Islamic University Kuala-Lumpur, Malaysia

***Abstract*:-- Nowadays, smart parking guidance system is a crucial research for people's convenience. The main objective of this research is to develop and analyze on a smart parking guidance system where current available system was compared to this new proposed system. Limited parking space has become serious issue since the number of Malaysia's populations who are using car keep increasing. Some of the big companies, shopping malls and other public facilities already deployed a smart parking system on their building. However, there are still a lot of buildings that do not own it because the system required a lot of investment, where the huge parking areas need higher cost to install sensors on each parking lot available. The proposed smart parking guidance system in this research was depending on a 360° camera that was modified on raspberry pi camera module and 360o lens and Haar-Cascade classifier. The image and video processing was by Open CV and python program to detect the available parking space and cloud firebase was used to update data where users can access the parking space availability by android mobile phone specifically at a closed parking space. A single 360°camera was replaced several sensors and camera which was implemented on traditional smart parking system. An analysis was done on the performance of the system where it can detect the parking availability with 99.74% accuracy and which is far better than conventional system including reliability and cost for the parking space guidance system.**

Keywords— Internet of Things; Cloud Computing; Raspberry Pi 3 model B, 360-degree camera, Smart Parking; Android app.

I. INTRODUCTION

A lot of study and researches have been conducted regarding smart parking system that already implemented around the globe such as (Prasse & Nettstraeter, 2014).Most of the research have proposed an upgrade and improvement to the conventional system according to the situation of the parking space that vary everywhere. The increasing number of researches on smart parking system have conducted until now telling us that the communities and industries still demand for a better system. Numerous smart parking system have today that are mostly using sensors to detect parking lots availability which is costly and lower in accuracy and reliability offered by the system. Some of the smart parking system that already available for installation nowadays. Both systems, either magnetic sensor or ultrasonic sensor are not very effective in term of cost. It is because both systems are requiring to install the sensors on every parking lot. So, it might be costly to implement. Thus, an improvement is made in this research in term of accuracy and implementation cost and reliability of the system.

THE 360° SMART PARKING GUIDANCE SYSTEM

The 360° Smart Parking Guidance System is a complex integration between Internet of Things (IoT) concept and image or video processing technology which made up a complete smart parking system. This research consisted of several parts such as camera technology, cloud system and end user application. The focus is on the development of 360° camera technology as the sensor and raspberry pi 3 model B was integrated with an image processing, mobile application and cloud system as what stated in the objective. For a simulation purposes, 5megapixel camera was used, and it is modified to become a 360° view camera by attaching additional lenses. Any image or video capturing processed through a python program and Open CV libraries before the data live on Firebase cloud platform and end user application. All of these was a concept of IoT architecture as depicted in the figure 1.

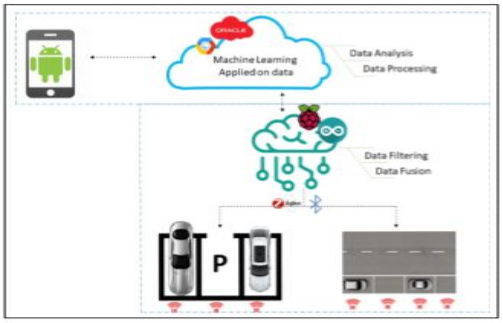


Figure 1. IoT architecture concept(Alsafery & Reiff-marganiec, 2018)

INTERNET OF THINGS (IoT)

The system of IoT is interconnected with computing devices, mechanical and digital machines, objects, animals and humans. It has the capability of transferring information from one device to another device without the help of any human resources. Internet of Things(IoT) first expressed by Kevin aston who is the executive director of Auto-ID Center.Today the IoT market scope is reaching at new levels that is estimated by the report of Gartnera in 2011 (Sardeshmukh & Ambawade, 2018).The IoT is highly flexible and feasible in efficiency that is highly depends on the algorithm which correlating and analysing the collected data through the quality of image data of IoT(Benita & Chalissery, 2017). Machine Vision is the promising solution to improve the current solution of IoT smart parking guidance system. This system consists of IoT, mobile application together with machine vision through digital image processing. Cloud Firebase is used as the database to store data collected from Pi at the same time allows mobile app, On the other hand, Firebase is used to enable user login and communication platform data storage. All users are need to register to the application with their user name, email and car-plate number. Besides, with the mobile application, drivers can reserve the parking space in advance. This system reduces the time for drivers to find and reserve the parking space.

CLOUD COMPUTING WITH IOT

Internet of Things(IoT) and cloud computing are two very different technologies. Cloud computing involves to deliver data, application, videos, image through the internet to data centers. Meanwhile, the Internet of Things refers internet connection of devices. All services, storage, data sharing and other system resources are available in the cloud for public use. The sharing process of all these data is called cloud computing and it is highly interrelated with the concept of IoT. By referring to(Hall, 2010), cloud computing architecture is always free and shareable with the world communities. It is important to keep it open-source because the system can be easily improved by the communities it self. "Cloud computing is categorized under three sub-group which is Public Cloud – available to all, Private Cloud – within an organization and Hybrid Cloud, which combined both cloud architecture model. The storage service available in the cloud is very huge and it is capable of handling real time activities and notifications required by lot of IoT devices (Princy & Nigel, 2015).Due to the existence of cloud computing some industrial equipment is replaced by a Cloud Robotics who can help in the automation process.(V, 2016) Human workforce can be reduced while the efficiency of the works increased due to data sharing available in the cloud storage(V, 2016). Raspberry pi board encompasses System on a Chip (SoC) it means it is a method of grouping all the valuable electronics to run on the individual chip and it also uses processor Broad com BCM2837 for various interfaces. Raspberry pi is flexible; it can use for general purpose computing. Hence, it is used for smart parking guidance system in this research while another solution was proposed by (Maenhaut, Volckaert, Ongenae, & Turck, 2017) with the title, Demo Abstract: RPiaaS: A Raspberry Pi Testbed for Validation of Cloud Resources Management Strategies. "The test-bed provides an easy-to-use environment for the initial evaluation of novel cloud resource management strategies and is designed to facilitate the step from simulations towards experimental evaluations on larger cloud tested.(Maenhaut et al., 2017). (Durnyak & Havrysh, 2018) computer vision techniques involved Fourier transform to process the input signal from a picture or video.

A RASPBERRY Pi WITH IoT

Raspberry Pi is a small computer that is widely used by the inventors, engineers and hobbyists to create an interesting research especially related to IoT research that needs connection to the cloud. Nowadays, Raspberry Pi becomes the most favourite processor to implement into a research because it is cheap and open source. A lot of information, tutorials, specifications and other miscellaneous data are freely available on the internet itself. Those data are important for an improvement to be made in the future. It is reliable for the commercial purposes as we can see several researches have been conducted by using Raspberry Pi either as the main component or supported component. In research paper(Collage, Collage, & Collage, 2017) and (Ojrulwkp et al., 2017) Raspberry Pi was implemented into a smart parking system. The author said that the objective of the research achieved while they managed to minimize the cost(Collage et al., 2017). On the other hand, (Korea, 2016)shows that Raspberry Pi can be used as a support component in a Smart Home system implemented developer version of Raspberry Pi 2 into their predictive Smart Home application and act as terminal system which able to communicate with the cloud server effectively. Figure 2 shows the architecture of the system for . Other than that, Raspberry Pi has been used to power cloud server in (Aktaruzzaman, Badhan, Adnan, & Alam, 2017) Smart Sensor Network for Smart Buildings(Lobachev, 2016), water Quality Monitoring system (Engineering, 2015)and a low-cost video trans-coder (Barais, Bourcier, & Dion, 2016). Smart Car Parking Management System Using IoT is a research

where proposed method had developed the traditional servicing channels like parking attendance and toll-both. They used Arduino Uno, Ultrasonic sensor, cloud server and Wi-Fi Module where the Internet of Things integrate software, hardware and network connectivity which allows to sense object and control remotely. However, the Arduino Uno has no any own operating system like Raspberry Pi.It needs to use windows or Mac OS. Thus while it will use any additional feature like Ethernet connection, video streaming and Bluetooth connection etc.- it may increase extra cost more than itself because of requiring to buy extra shields. Hence, Raspberry pi is selected for this research based on its feature and price.

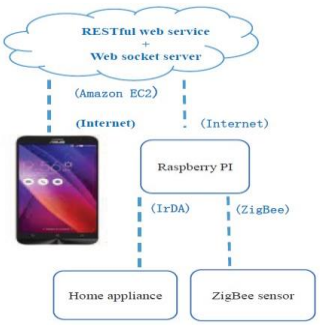


Figure 2. Raspberry Pi implemented in Smart Home system(Korea, 2016)

First part introduces the research area and overview of the research. A comprehensive review of the literature on this research area represents in part two. We reviewed different smart parking guidance techniques that apply for finding available parking space for this research purposes. Third part describe the methodology used in this research and fourth, fifth and sixth and the rest part introduces the result, the user acceptance test for the system, discussion , conclusion and future work simultaneously.

II.RELATED WORK

Past few years, smart parking system have been demanded by the communities across the globe and it can be seen in almost every developed country nowadays. Tremendous amount of research on smart parking system been conducted every year. Since then, this kind of high technology system has gone through big improvement. It all started with wired sensors being used and installed on every available parking slots just to detect the presence of a vehicles.(Kumar, Chilamkurti, & Soh, 2007) did mention in their paper, one of the famous research being conducted during that time is Siemens Si Park. After that, people started to realize that the old system need an improvement on detection accuracy, reliability, installation cost power consumption, communication protocols, communication efficiency, and time used to find parking lot, signals delay and much more. There are many researcher for example (Guerrero-Ibáñez, Zeadally,& Contreras-Castillo, 2018)used sensor technology for detecting the parking system where sensor based parking guidance system is designed for indoor parking. This system is harder to be implemented as it need wirings to interconnect sensors and LED. (Ng, Loong, Isaak, & Yusof, 2019) proposed vision based smart parking system using Internet of Things where 5megapixel camera is used that was connected to Raspberry pi 3 model B camera module and canny edge detection technique was used as method for detection. Image quality is improved and detecting the parking vacancy with 98% accurately in real time. However, the accuracy of this method may improve by using better camera and method. (Bibi, Majid, Dawood, & Guo, 2017) have done a research on Automatic Parking Space Detection System. A web camera is used to get the images of the parking area and image processing techniques are used to detect the presence or absence of cars to count and locate the available parking spaces which achieved the average performance is 99.5 % and is very high as compared with other parking lot detections applications. The result shows that when the captured images of the parking lot are not clear because of less lighting or occlusions, the efficiency decreases and the accuracy for detection's reduces. (Bao, Zhan, Xu, & Hu, 2017) have work on A novel dual microwave Doppler Radar based vehicle detection sensor for parking IoT occupancy detection. Doppler radar transceiver module was used to detect the movement of a parking vehicle where motion recognition method was presented to identify the vehicle behavior and generate the parking space occupancy Doppler radar sensor detected the vehicle movement clearly and the detection accuracy achieved higher than 98%. However, the system design is more complicated. (Dokur, Katkoori, & Elmehraz, 2016) have developed Embedded System Design of a Real-time Parking Guidance System. This system consists of Arduino, ultrasonic sensor, and a temperature sensor. Detection logic was then developed to identify a car after analyzing the initial test results. This logic was extended to trigger a camera to take an image of the vehicle for validation purposes. The proposed system has mitigated their objective. However, ultrasonic sensor is expensive in installation because it requires a sensor for each park and its sensitivity to the fluctuation of temperature and extreme air turbulence.

III.REARCH METHODOLOGY

The research purpose was to explore and study the different techniques that used in smart parking guidance

system to develop a cost effective process to find available parking slot and reservation purposes. The method employed in conducting this study was a simulation to achieve the research objectives. Therefore, it was briefly described about some of hardware and software system that used in this research to develop the prototype.

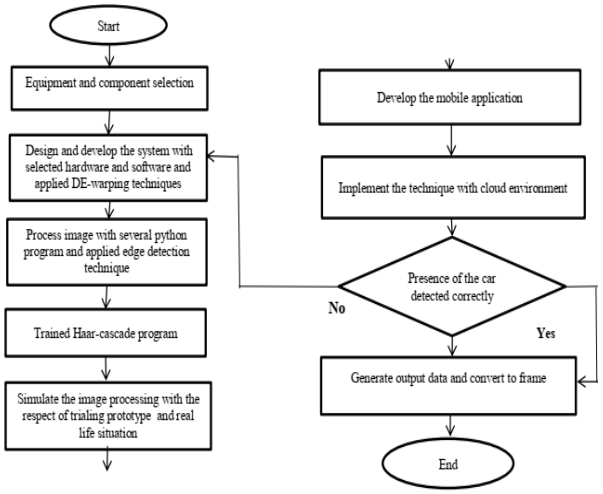


Figure:3. Smart parking guidance system

SYSTEM DESIGN DEVELOPMENT WITH HARDWARE AND SOFTWARE

The system design and development of this research involved 3 stages which is image processing, cloud development and mobile application development. The main focus was on image processing as the main sensor of this research is the camera itself and it is used to detect the availability of the parking lots. In this research used Raspberry pi instead of other microprocessor for prototyping purposes mainly because of the prices and the capability of the devices. Figure 4. below shows the whole process involved in this research. First, the Raspberry pi camera is attached to the Kogeto Dots 360o lens converter. The camera is attached to the Raspberry pi port. Image processing are integrated through the Raspberry pi by using Python and Open CV. To do the simulation, the camera is placed somewhere at the center of the parking space which can get more view of the parking lots. After that, video is processed through the Raspberry pi by using a technique called edge detection which detect the changes on the pixels. The presence of a car is monitored before it is sending to the cloud (Firebase) and the user mobile application. On a user site, they can reserve any available parking space and google maps API is used to allocate the time before user arrived on the parking spot.

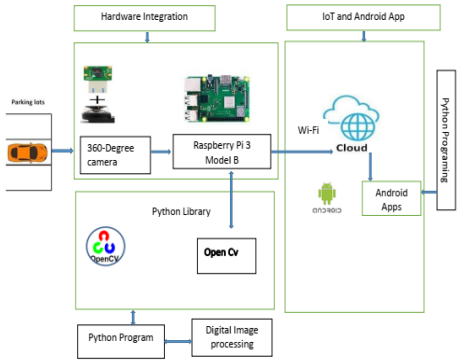


Figure.4. whole process of Smart parking guidance system method.

IMAGE PROCESSING

There is several preprocessing with python programs implemented for the image/video processing in this research such as:

- Varying the brightness of the subject
- Scaling the objects
- Blurring and sharpening the image captured
- Thresholding
- Edge detection

Edge detection is the main techniques that was used in this research. Each parking space have line edges that separated each lot. So, those lines used as background reference to specified parking space number.

HAAR-CASCADE CLASSIFIER

In the figure, shows the block diagram of the proposed method. The system tries to find the presence of the car in the parking from the video which was taken by 360-degree camera. The car image was taken from the front and back of the cars for training. The XML file was used for detecting the presence of the that was created after training the classifier. To train the program these are the main steps was taken:

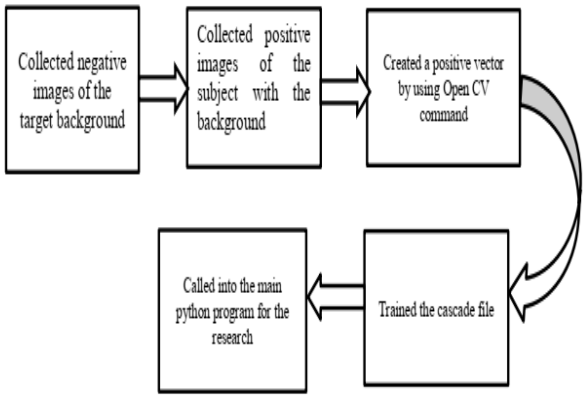


Figure.5. Haar cascade training method

Haar Cascade is a classifier is created by the author(Viola & Jones, 2005) to detect and track the object in the image. To train the classifier positive image contain the wanted object where negative contain the unwanted object. the classifier scans the features (shown in Figure6) which create the specific target values on the positive images by using the sum values of black and the white areas of the features. For detecting and tracking the object, classifier tries to create most optimized target values by changing the size of the features. Features are the weak classifier because they can't be a correct classifier alone. The image of the object contains many feature and object where they are collected. In the image facilitate the detection of the object using a lot of positive and negative images. Classifier runs basically mentioned in the above. The efficiency of finding the object in the image depends on the method of training classifier using number of positive and negative images.

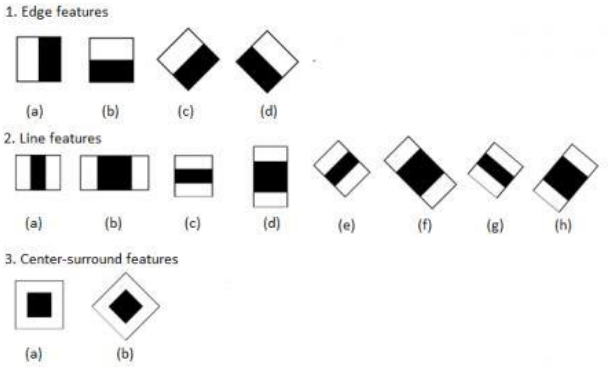


Figure:6. Features of the classifier

Haar cascade file was used together with the Open CV to be the reference on subject image. There are several precautions was followed to obtain good result such as:

• Negative images collected between 1000 to 1500 snapshot

• Negative images size was must be larger than the positive image (negative: 100x100 & positive image: 50x50)

• The ratio of negative to positive images was 2:1

TRAINING THE HAAR-CASCADE CLASSIFIER

For training the classifier used lots of positive and negative images. Some positive images are shown in Figure.8 and 9 which are taken from the source. We trained the classifier using the positive images

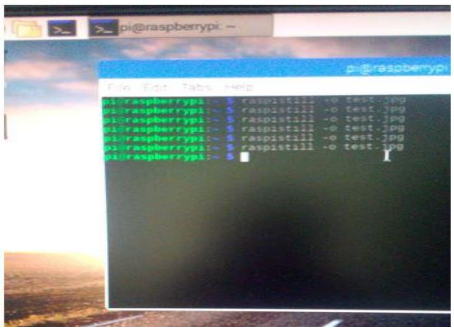


Figure:7. code for image collection.

Figure 8. Positive image collected

Figure 9. Negative image collected

The positive images contain the wanted object(car) but negative image does not contain the wanted object.The positive images were re-sized to 50*50 pixels where negative images were re-sized to 100*100 pixel and converted to vector file. After them, the number of positive images is determined that was used in training. For determining this number (x) Equation (1) is used.

$$X \le \frac{\left(Number\ of\ \ pos.Img - Number\ of\ neg.Img\right)}{1+\left(Number\ of\ \ stages-1\right)\times\left(1-MinHitRate\right)}$$

In this equation, number, of stages indicates that in how many stages the classifier reaches to the result and the min hit Rate indicates the minimum hit rate in every stage. Other parameters to train the images are Max False Alarm Rate. First of them represents the acceptable maximum false alarm rate for the training section of object. The second one represents the memory that allocated for training the classifier. For this study, the parameters are selected as number of Stages:24, min hit Rate: 0.995, max False Alarm Rate:0.25.

MOBILE APPLICATION WITH OPEN CV AND CLOUD

This research was integrated with the mobile application in IoT. The app was created by Android studio which is integrated development environment (IDE) for the device

run by Android operating system(os.) This IDE is substituted with other prominent IDE (like Eclipse, NetBeans etc.) because of its elasticity to the designer along with its emulator to experiment the APPs in the various devices virtually. However, the open CV for the image processing with Android library functions mainly intended for the real-time computer vision.CV is written in C++ but it provisions different stage for the computation such as Windows, Linux, OS x, Free BSD, NetBSD and also for mobile like Android, iOS, Maemo Black berry 10. Moreover, cloud platform was implemented specially for management. The data for the presence of the car parking and number of parking availability is updated in the cloud firebase that is the real time video process though the 360-degree camera sensor and processed through the Open CV with python program on raspberry pi. It is able to monitor the parking area and check for the presence of cars. The cloud was connected to the mobile application. Thus, when user reserved their parking lot with specific plate number, it is automatically being updated on the cloud. There are several main components involved in the application:

1. Shows available parking lot
2. Parking lot reservation
3. User need to enter their plate number upon reservation

IV.PERFORMANCE OF PROTOTYPE

Figures 10, 11 and 12 below are the result of image / video processing recorded. For the preliminary result, the video is first recorded than processed by the Open CV software. However later, the video is live stream and the process happened at the same time.

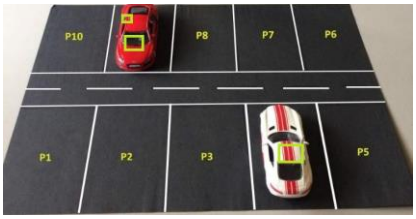


Figure 10 1st trial for

On the first trial of video processing, the detection is not very accurate, it is detected some unnecessary part of the car and background. The rectangle size, color and thickness was set inside the python program. The region of interest (RoI) was set inside the trained haar-cascade .xml file which called inside the python program. This trial was used 300 negatives background images and 150 positives subject image.

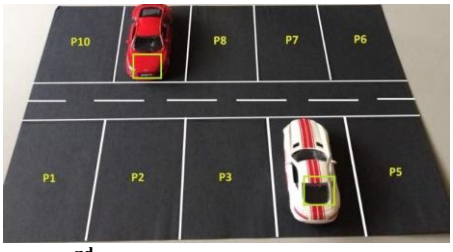


Figure .11.2nd trial image processing for prototype

As it is seen the result for second trial, the video was recorded in light condition in sunny weather. The program is now recognized the car correctly. The accuracy of car detection is 100%. However, we only need one detection per car. On this stage, the haar-cascade used are 1500 negatives background images and 750 positives subject images. It is observed that the accuracy depends of the proposed method is the number of image training for the feature detection.

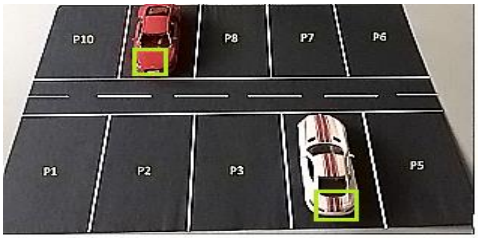


Figure.12.3rd trial for prototype simulation

The video was recorded in occluded weather when the light condition was quite low. But the in this situation the system can detect the car accurately until 99.49%. The preliminary result is until this stage only for the prototype.

EVALUATION METRIC FOR PERFORMANCE ANALYSIS

To test the performance of proposed method, the efficiency of the system is measured with video taken at different time intervals. The performance is calculated by comparing the results of occupancy to the ground truth value. The performance of the proposed system is measured by the using the equation (4). Ten slots per test is considered for the experiment.

Number of Total Slots=10*(Tests performed) …… (2)

Number of Correct Slot Detections=10*(Correct Detections in the Tests performed) …… (3)

Accuracy percentage = (Number of correct slots detected/ Total slots) *100……. (4)

Table.1. Performance result of prototype

Car appearance	Test performed	Correct detection	False detection	Accuracy
Sunny	149	149	0	100%
Occluded	199	198	1	99.49 %

It can be seen from the table that the accuracy is to be 100% and 99.49% accurate during sunny and occluded weather. Low light condition has effect to decreases the efficiency and the accuracy for detections during occluded weather. It is proved that the performance is 99.74 % on average. The accuracy is comparatively high among other systems detection. It is also highly depending on the camera used for the parking lot monitoring system of the proposed work.

Table.2. Comparison of Detection Rate between pieces of research works and this work based on camera and method for the prototype.

Author-year	Title	Proposed method	Camera/sensor	Detection Rate
Ng, Loong, Isaak, & Yusof, 2019	Machine vision based smart parking	canny edge detection technique	5megapixel camera	98%
Bao, Zhan, Xu, & Hu, 2017	A novel dual microwave Doppler Radar based vehicle detection sensor for parking IoT occupancy detection	Doppler radar sensor	motion recognition method	98%
This research	smart parking guidance system using 360° camera and haar-cascade classifier on IoT system	360-degree kogeto lens with 5 megapixel camera module of raspberry pi	Haar-cascade classifier	99.74%

V. USER ACCEPTANCE TEST WITH DEVELOPED APP AND CLOUD FIREBASE IN IoT

The prototype provides back-end hardware and software support for users to book and access a parking spot. The system tested by providing some recorded videos that held by 360-degree camera from the prototype parking space which was arranged for 10 parking space and that was processed through the Open CV and python program which detected the presence of the car and the availability of parking data was being updated in the cloud firebase that was connected with the android app developed by android studio. Here are some of the figure showing the(UAT) User Acceptance Test.

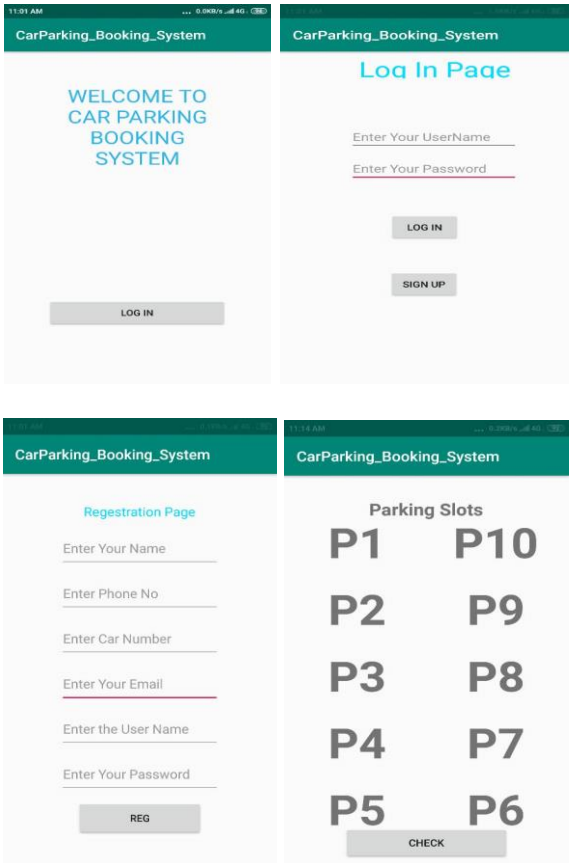
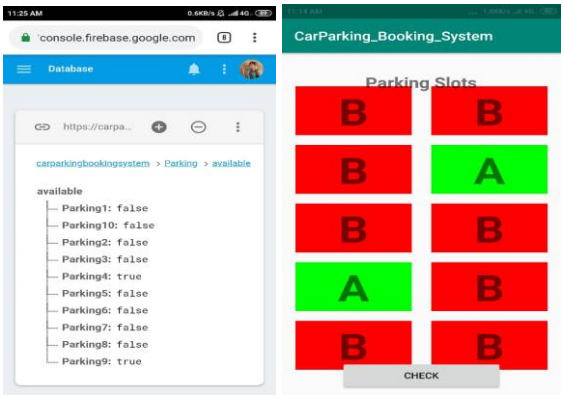


Figure15(a)Booking welcome page Figure(b) Log in or signup page Figure(c)Registration page.

To access the parking information, users should install the app namely "Car Park Booking System" on their smart phone. Then they will be able to access the app with various activity like Figure (a). The welcome page for the interested user to access the app . To access the app, user must need to do the registration with the signup navigation bar and after doing the registration they need to login with the valid username and password that used for the registration that mentioned in figure(b), (c) and (d).



Figure(d) Log in page Figure(e)Check parking slot Figure(f) Figure (g) Parking availability information in firebase Figure (h)Access parking availability with red color.

In the figure (e) and (f) showing that after successfully login user can access the real parking information by their apps that is updating in the cloud firebase where for available number of parking space is mentioned by false condition and the presence of the car is showing with true condition. Then the data get by the app is with red color for the available parking lot and green color mentioned the booked number of lots in the figure(g).

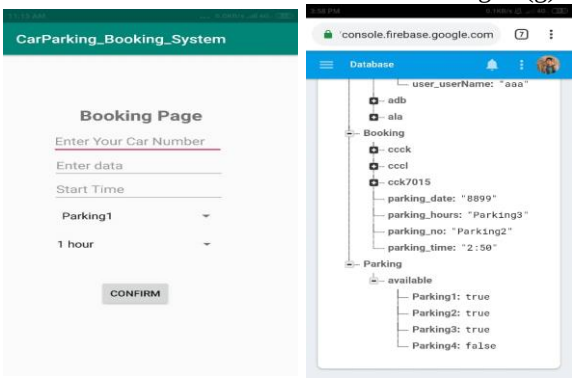


Figure. (h) Booking parking Figure (i) Update booking information in the cloud firebase and started time.

Figure(h) shows the booking process with complete the three steps that are car licence number including the date and time when want to use the park. Then that information was being updated in the cloud firebase showing in figure (i).

VII.DISCUSSION

Based on the simulation the result is satisfactory and it can come to conclude that the developed prototype is reliable and have better detection accuracy compared to others system. The UAT (User Acceptance Test) shows that 360° smart parking guidance system is a research that uses IoT monitoring system for real time data and that does not involve any human involvement physically. Back end users is able to monitor real time data and interact with it from their gadgets such as smartphone through the Internet. In this research mainly the tested result is calculated based on prototype simulation. Therefore, the result tested in two weather condition like sunny and occluded where in sunny condition, the accuracy reached up to 100% but in occluded weather condition has possibility to fall the accuracy bit up to 99.49%. Moreover, the accuracy depends on the number of image trailing in haar-cascade method. Because of that a large number of positive and negative images need to train where the ratio of images training is 2:1.

VIII.CONCLUSION

Smart parking guidance systems in IoT are considered as sophisticated therefore the problem is that it's not available to the general people due to higher cost associated with the complexity related to the setting up such a system. However, due to its rising popularity in the smart parking guidance system more and more researchers are working to make this technology accessible to the population. The major objective of this research was to build an easy and efficient parking guidance system which could be used for finding and reserving the empty parking space with their mobile phone. In this attempt a prototype device that include 360-degree camera has been modified to capture image and dataset was created for training and testing purposes. Utilizing Haar-Cascade method the system was developed which is a reliable and able to detect the presence of the car and the parking space availability with 99.74% accuracy on average that is far better than other systems. By implementing this smart parking guidance system, it will lead more convenient and hassle-free lifestyle for the urban drivers as they will be able to monitor remotely and book their parking spot and this will lead to the improvement on time and fuel consumption. Moreover, communities in today's world demands more parking area that is convenient to use and less complicated. Thus, this concludes that it will lead a smarter environment and urban drivers will have a productive situation as they can monitor specific parking lot that they want to use for reserving remotely at the same saved their time and money for fuel consumption.

FUTURE WORK

Grubbing on the knowledge and experience gained on this work, there is a huge chance of improvement in the future. At first there were some boundaries, which are needed to be stunned to make the system simply

accessible. A better cloud architecture should be used because the 360° camera consumes a lot of bandwidth which causes a delay during uploading and downloading process. Subsequently, replace the camera with a proper 360° camera integrated with night vision abilities as to overcome low light condition. Moreover, a better method can be used to increase its accuracy because haar-cascade classifier needs a lots of positive and negative data for training and the accuracy is highly depending upon the number of trained data.

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Fake review detection using weighting algorithm in NetSpam framework

[1] Chaitrali S. Kardile, [2] Revati M. Wahul
[1] Student, MESCOE, Pune, Maharashtra, India, [2] Assistant professor, MESCOE, Pune, Maharashtra, India

***Abstract*:-- Now a day's our life has become more dependent on social media. Social has opened many opportunity for business so, whenever customer wants to buy new product they will look for other people's opinion. Social media has also have major drawback for business strategies which is spammers. Spammers create spam surveys about various products which mislead a consumer. This online opinion plays important role in business strategies, while positive opinion gives good publicity and market on the other side negative opinion gives bad publicity and market which affects the service providers. To avoid this spammers there have been many research but very have work on user and review related feature. In this investigation we propose a classification system using heterogeneous information network NetSpam framework. This system will classify spam and non-spam reviews using NetSpam algorithm and naïve bayes classifier for sentiment analysis which will provide positive and negative value of the product review. And furthermore if wants to search top product, user can use search query, in addition to that it will display recommendation product on the basis of user's point of interest.**

Keywords— Social Media, Amazon API, Spammer, Spam Review, Heterogeneous Information Networks, Naive Bayes, Metapath

I. INTRODUCTION

Consideration of online reviews or opinions in decision making process has become important. Online reviews plays role of a information resource for purchase decision making, marketing and product designing. Due to profit or fame , imposters have been writing deceptive or fake reviews to promote and\or demote some target product or services. Such imposters are called as review spammers [1]. Positive opinions mean a huge publicity with maximum profit which unfortunately provide strong motive for spammers to post fake reviews. Posting fake reviews results in disrepute business and targeted product. Product which has more positive review attracts more customer's attention than product with less positive reviews. For the marketing purpose and to give more economical benefit to particular product spammers mislead a customer by giving unfair positive reviews of a product and to defame or to damage a reputation of particular business spammer leaves a negative review of a product on social media. Fake review detection has been studied by researcher for multiple times using markov random field [1],positive- unlabeled learning[2], also linguistic patterns, behavioral
patterns, graph based algorithm still there is been some aspects are unsolved.
The main objective of NetSpam framework is to use heterogeneous information network(HIN) to build retrieved review data set and convert spam it into classification problem from spam detection problem. In converted HIN review dataset, reach review is connected with each other via different features. To understand the importance of feature weighting algorithm is used, after that this calculated weight used to calculate the very last labels for reviews using both unsupervised and semi-supervised procedures. NetSpam is helpful in identifying importance of feature from the matapath definition and also calculated weight of features. Using feature with more weight leads to indentifying spam with more accuracy and less time complexity.

II. REVIEW OF LITERATURE

In paper [1] author proposes to use Markov Random Field (MRF) to model a reviewers by building a network of appearance of reviewers in burst and apply the Loopy Belief Propagation (LBP) method to identify in case a reviewer is a spammer or not in the graph. A novel assessment method to evaluate the detected spammers automatically using supervised classification of their reviews. Advantages are: High accuracy, the proposed method is effective. To detect review spammers in review bursts. It detects spammers automatically. Disadvantage is: a generic framework is not used for detect spammers.
H. Li has extended a algorithm for classification of group called multi-typed heterogeneous collective classification into collective positive and un-labeled learning [2]. In both PU and non-PU learning environment strong baselines can be increased by F1 scores. Advantages of this model is that this Models only use self-contained features language and can be smoothly generalized from

one to another language. It helps to identify fake reviews hiding in the unlabeled reviews that Dianpings algorithm could not indentify.

Author B. Viswanath [3] has used user behavior to classify bad behavior from normal behaviour using unsupervised anomaly detection. To find diverse attacker schemes fake, compromised, and colluding Facebook identities with no a priori labeling while maintaining low false positive rates. Anomaly detection technique to forcefully identify anomalous likes on Facebook ads. It achieves a less than 0.3% false positives with a detection rate more than 66%.

Ch. Xu and J. Zhang [4] proposed to use online product review collection with wise features which can show detailed view of spam campaigns. To cooperate with intuitive and unsupervised wise features author has proposed fraud informer framework. Advantages of this Pair wise features is that to manipulate reviews as per a their best interests it can be ranked in the website globally so that highest rank ones can be found first by using a robust model for finding correlation in colluders. and at the disadvantage it is difficult problem to automate.

M. Crawford elaborates [5] two distinct methods of reducing feature subset size in the review spam domain. The methods include filter-based feature rankers and word frequency based feature selection. After a selecting mostly appeared text in first method it uses chi-squared to rank and select top ranked feature in second method.

A. Djunaidy [6] proposes system ICF++ which uses a text and rating property and it measure the reliability value of a product ,also honesty value of a review along with the trustiness value of the reviewers. Accuracy of this system is better than ICF method. Precision is maximizing.

III. PROPOSED METHODOLOGY

In our system we are using NetSpam framework which is proposed by author Shehnepoor [7]. In this framework, a fresh spam weighting technique is suggested to determine the comparative significance of each feature and show how efficient each feature is in defining spam from ordinary reviews. Alongside NetSpam framework we have used naïve bayes classifier algorithm for sentimental polarity of reviews and Algorithm Top-K-Join-Tuple for the recommendation of product as per user's point of interest.

Proposed framework solves a classification problem by using given dataset as a heterogeneous information network (HIN) [7]. In this review dataset, by using feature and users each node is connected with each other. In NetSpam framework weighting algorithm has been used to calculate weight or a importance of feature, which after that will be used for labeling of review. With the weight of features it calculate the final labeling using supervised and unsupervised methods. To understand how much each feature has contributed in spam detection we have used behavioral and linguistic feature based on user and review.

A. Architecture

Fig.1 demonstrates the architecture of the proposed system. Our suggested system's overall idea is to modify spam detection into classification using dataset as heterogeneous information network. Model review dataset in specific as in which results are linked by distinct kinds of nodes. A weighting algorithm is then employed to calculate each features importance. These weights are applied to calculate the final labels for reviews using both unsupervised and supervised techniques. This is based on the findings that define two feature opinions.

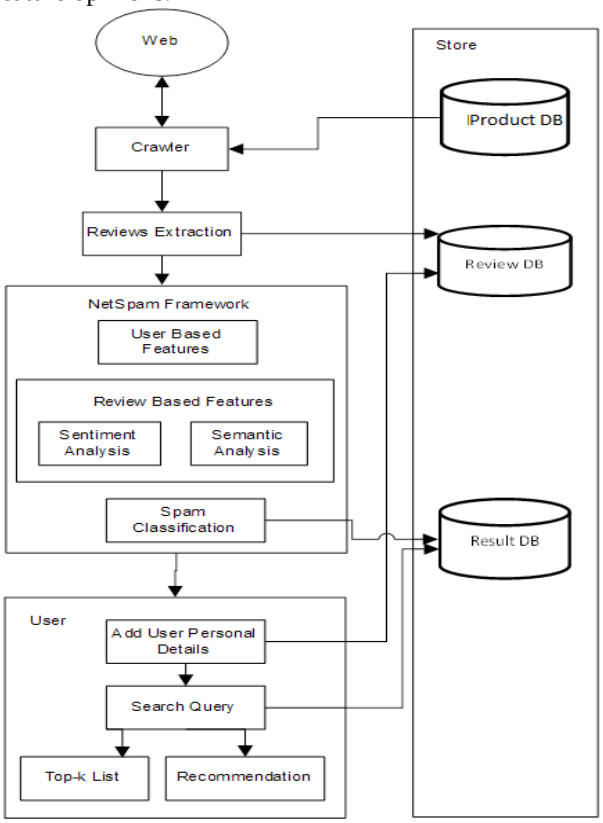

Fig. 1 System Architecture

B. Algorithms

1. Naïve Bayes Classifier Algorithm

Input: Reviews from Amazon API

Output: Sentimental Polarity of reviews

Process:

Step 1: Get the input reviews
Step 2: Assign number of features n[i] where i ranges in 10, 100, 1000, 10000 and 15000.
Step 3: for n in n[i]
Step 3.1: Create wordscore()
Step 3.2: Find_best_words(wordscore,n)
Step 3.3: Evaluate (best_word_features)
Step 4: Create wordscore()
Assign posword[j] and negword[k] Split the words by removing punctuations
Build frequency distribution of all words
Step 5: Find_best_words(wordscore,n)
Find number of positive, negative and total number of words
Build dictionary of the wordscore based on the Chi-square test (i.e.) word_score[t]
By sorting the wordscore, bestwords are found
Step 6: Evaluate (best_word_features)
Assign posfeatures[j] and negfeatures[k]
Split the sentences into individual words.
Select ¾ of the features for training and ¼ of the features for testing
Train using Naïve Bayes Classifier
Step 7: Reviews are classified as positive and negative based on the score words

2. NetSpam Algorithm:
Input: review_dataset, spam_feature_list, pre_labeled_reviews
Output: features_importance (W), spamicity_probability (Pr)
Step 1: u, v: review, y_u: spamicity probability of review u Step 2: $f(x_{lu})$: initial probability of review u being spam

Step 3: P_l metapath based on feature l, L: features number

Step 4: n: number of reviews connected to a review

Step 5: m_u^{Pl} : the level of spam certainty

Step 5: $m_{u,v}^{Pl}$: value of metapath

Step 6: Prior Knowledge

Step 7: **if** semi-supervised mode

Step 8: **if** $u \in pre\_labeled\_reviews$

Step 9: $y_u = label(u)$

Step 10: **else**

Step 11: $y_u = 0$

Step 12: **else** unsupervised mode

Step 13: $y_u = \frac{1}{L}\sum_{l=1}^{L} f(x_{lu})$

Step 14: Network Schema Definition

Step 15: schema = defining schema based on spam-feature-list

Step 16: Metapath Definition and Creation

Step 17: **for** $P_l \in schema$

Step 18: **for** $u, v \in review\_dataset$

Step 19: $m_u^{Pl} = \frac{\lfloor s \times f(x_{lu}) \rfloor}{s}$

Step 20: $m_v^{Pl} = \frac{\lfloor s \times f(x_{lv}) \rfloor}{s}$

Step 21: **if** $m_u^{Pl} = m_v^{Pl}$

Step 22: $m_{u,v}^{Pl} = m_u^{Pl}$

Step 23: **else**

Step 24: $m_{u,v}^{Pl} = 0$

Step 25: Classification - Weight Calculation

Step 26: **for** $Pl \in schemes$

Step 27: **do** $W_{Pl} = \frac{\sum_{r=1}^{n}\sum_{s=1}^{n} mp_{r,s}^{Pl} \times y_r \times y_s}{\sum_{r=1}^{n}\sum_{s=1}^{n} mp_{r,s}^{Pl}}$

Step 28: Classification - Labeling

Step 29: **for** $u, v \in review\_dataset$

Step 30 $Pr_{u,v} = 1 - \prod_{Pl=1}^{L} 1 - m_{u,v}^{Pl} \times W_{Pl}$

Step 31: $Pr_u = avg(Pr_{u,1}, Pr_{u,2}, \ldots, Pr_{u,n}$

Step 32: return (W, Pr)

3. Algorithm Top-K-Join-Tuple (R, S, j, K, T)
Input: relation R, relation S, the rank function f, the number of join tuples K, and the lower bound T of the rank function;
Output: top-K tuples from R that can be joined with tuples from S,

Process:

Begin

k:=0; //Number of tuples in R that has a join candidate in S

u:=0; //Row number of the current tuple in S

While k<K and u< S.length

u: =u+ 1 ;

v:=0; // Row number of the current tuple in R

While k<K and v<R.Iength

v:=v+1;

If tuple S (u) and tuple R (v) satisfy the join condition and

f(R (v).r (p), S (u). S(q)) is greater than T

Then

Output (v, u, f) to the rank queue of R;

k:=k+l;

End If

End While

End While

End

C. Features

We have used the notion of metapath to create the following connection between reviews. A metapath is defined as a route between two reviews, indicating the link between two reviews by sharing characteristics. Refer to its overall definition, which is information on information, when talking about metadata. In our case, the data is the review in text, and metadata means the collection of review data, including the user as a individual who wrote a review, the business or service provider for whom the review has been written, the rating given to a product, a date on which review is uploaded, and label to a review of being spam or genuine.

Metapath is created using following features:-

i. User Behavioral

This features is about the each individual who is posting a review as a user. We have used this feature to categorize all the reviews which are written by particular individual. This feature has to divided in two categorize that are burstiness and negative ratio. Burstiness is used to identify review written by single user in short period of time. Negative ratio is destructive reviews or ratin with low scores which are posted to defame competitive business.

ii. User Linguistic

This feature is derived from the users feelings or opinion about particular product or service provider. This feature is categorized in Average Content Similarity (ACS) and Maximum Content Similarity (MCS). Spammers generally write reviews with same template to avoid time wasting and as a result they have same reviews. This feature requires semantic analysis to be performed to detect copy paste mechanisms used by spammers. The copy paste reviews written by spammers can be identify by calculating time between their start and end of the posted review because to post fake review with many word take less time than original posted review.

iii. Review Behavioral

Metadata of the review is used in this feature to identify spammers. This feature is categorized review on basis of early time frame and rate deviation. In early time frame fake reviewers or spammers try to write their review in short period of time to keep it in recent reviews or in top reviews. Rate deviation is used to identify spammers on basis of rating or high scores. To get more publicity or business spammers rates high a particular business. As a result, businesses gets variation in scores also high variance and deviation which affects the economy of business

iv. Review Linguistic

Extracted text of a reviews used in this feature. Review linguistic is categorized into First Personal Pronouns(PP1) ratio and also Ratio of exclamation mark. When the spammer uses '!' in sentence and second pronoun to attract more users attention and make impression.

IV. RESULT AND DISCUSSIONS

To implement this system we have used personal computer with basic hardware requirement and mysql 5.1 backend database and JDK 1.8. This web based application has used Eclipse Luna and Tomcat Server to design code.

Experimental evaluation results show that the Amazon product review dataset has better performance with a maximum percentage of spam reviews because when small segment of spam reviews builds, the likelihood of a review being a spam review increment will result in more spam reviews being classified as spam reviews. The Fig. 2 graph shows the NetSpam framework features in which first position, the dataset have more weights and features based on Review dataset stand in the second position. User and item based dataset stands in third and fourth position respectively with the minimum weights. Fig.3 graph shows the total 510 reviews of Amazon single product reviews classified the 185 reviews are spam and 325 reviews are non-spam by using NetSpam framework.

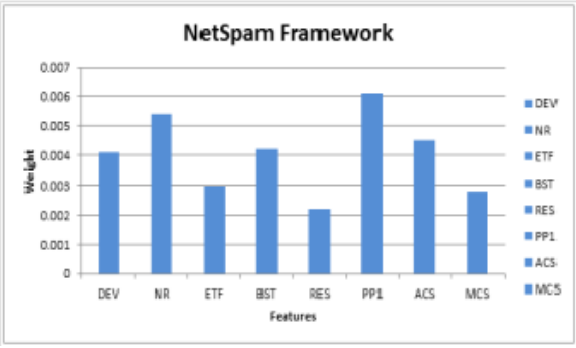

Fig. 2 Feature weights for NetSpam Framework

TABLE I Weights of all features

Features	Weight
DEV	0.0041
NR	0.0054
ETF	0.003
BST	0.0042
RES	0.0022
PP1	0.0061
ACS	0.0045
MCS	0.0028

Fig. 3 Spam and Non-spam reviews count

The proposed NetSpam framework time complexity is $O(e^2n)$. The netspam framework accuracy is 95.06% which is better than SPaglePlus Algorithm accuracy is 85.14% on using Amazon API for product review dataset.

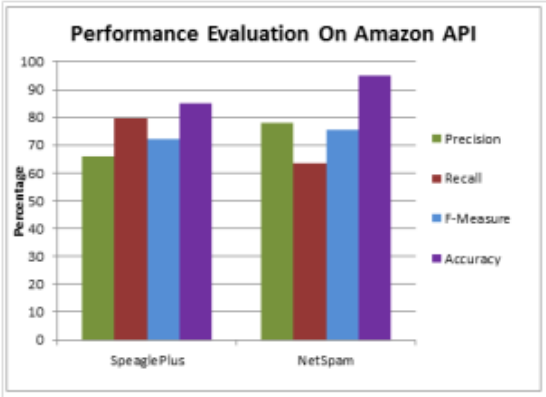

Fig. 4 Performance Analysis between existing and proposed system

V. CONCLUSION

This paper proposes a spam detection system in particular NetSpam in view of a metapath idea and another graph based strategy to name reviews depending on a rank-based naming methodology. Contribution part in this project, applied the Naive Bayes algorithm for sentiment analysis for negative ratio feature's weight calculation. And also for user when searches query he/she will get the top-k product lists as well as one recommendation product item by using personalized recommendation algorithm.

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Robot Manipulator Programming Interface based on Augmened Reality

[1] Alexander Schwandt, [2]Arkady Yuschenko
Robotic Center of Education and Research, Bauman Moscow State Technical University, Moscow, Russia
Izmaylovskaya Sq., 7, 105007 Moscow, Russian Federation

Abstract:-- **The integration cost of industrial robots into small and medium sized enterprises (SMEs) is nowadays one of the main obstacles to make automated solutions profitable. The standard implemented human robot interface (HRI) in industrial robots, is complicated and time consuming even for trained technicians. A well-known trend in robotic manipulator development, known in the field of intelligent HRI, is aimed at to make automated solutions with industrial robots cost-effective. A HRI based on augmented reality (AR) is presented to cut short the programming phase during commissioning of industrial robots in the production line. The system proposed in the given article was implemented on a portable computer in accordance with an AR-Stylus using safety goggles mounted with a high-resolution camera and a wearable display. The hardware setup presented was used in an experiment to show, how the HRI's basic functions, namely intuitive robot programming by demonstration (PbD), visualisation and simulation of industrial robots program, could be implemented. A high level of encapsulating the programmer into an AR environment was achieved by configuring a camera tracking the 6D position of the AR-Stylus and a real-time projection of the 3D robot gripper model virtually substituting the AR-Stylus. In contrast to the HRI based on the conventional PbD method, this paper covers a new type of PbD called "virtual robot programming by demonstration" (vPbD). The accuracy of the HRI system in determining the position of the AR-Stylus was experimentally analysed. In a sequential robotic program, apart from visualising the endpoints and the trajectories in WD, a real scale 3D model projection of the robot gripper is aligned in real-world environment from the observer's perspective. This enables the operator to detect potential collisions of the robot gripper with the surrounding with efficacy. Further conclusions and developments pertaining to the study will be followed.**

Keywords— Robot Manipulator • Human Robot Interface • Augmented Reality • Robot Programming by Demonstration • Collaborative Robotics • Intuitive Programming.

I. INTRODUCTION

Similar to automobiles, industrial robots are nowadays common in mass production industries. Furthermore in small and medium sized enterprises (SMEs), the demand for industrial robots have increased in the last few decades. Yet there is no broad spectrum exposure of industrial robots in this sec¬tor. This can be owed to the fact that industrial robots pose high costs of integration and (re)programming during an ongoing production, which might change frequently due to small scale productions. In order to make industrial robots more common within SME, the human robot interface (HRI) should be made systematic, simple and self-explanatory. This renders an affordable solution for SME demands to automate production steps in frequently changing production lines. As a result no professional adjustment or reprogramming is required.

Normally the programming procedure for an industrial robot is sequentially setting the tool center point (TCP) at the desired points, subsequently saving them in a program. Unless and otherwise tutored and used widely, this procedure poses several safety risks for the operator. In the traditional programming initially the robots are moved using the teach pendant which is often inconvenient in getting the TCP to the desired point, where the operator's focus changes frequently between the robot and the teach pendant, thus slowing down the entire process of programming. Moreover the opera¬tor may surpass the robot's moves. After the program points have been taught to the robot, the resulting program can only be visualized in a simulation environment. Usually during in commissioning, the operator evaluates the robot's program gradually. Repeating the above mentioned method several times can be time consuming and complicated for amateur trainers programming a simple operation for the robot. An approach to accelerate the programming phase is done by using a portative system. This system provides the operator with the needed information and visualization in terms of augmented reality (AR) through a 6dofwearable display, and receives simple high level teaching commands via buttons on an ergonomic AR-Stylus.

B.Akan proposed a system in which AR is combined with Virtual Reality (VR) environment and a speech recognition system to implement an intuitive HRI. AR stands for computer generated graphics, text and three dimensional (3D) models, which overlay on real video

stream. In comparison to B. Akan's system, the system presented differs in the entire visualization and simulation tasks where the operator can move freely. Thanks to a wearable display, the operator's view in an AR environment is free of interference. This feature allows the observer to maximally integrate into the AR environment. Moreover no additional sensor equipment's, like cameras are needed to be installed on a robot. For determining the observer's perspective, it is necessary to install planar QR-markers on the end effector.

The main aim of this approach is to integrate additional infor¬mation into the operator's real visual field. The 3D optical visualisation of processes in computer numerically controlled (CNC) machines, as described by Olwal [3], serves as an example for the usefullness of AR in industrial applications. AR proves to be advantageous in the field of human robot interaction, where especially in tele-robotics applications, AR allows the operator to perceive things as if he were present at the remote target environment [4-6].

In addition a portative system and a wearable dis¬play was used in paint applications for convenience. Reference points were projected into the operator‘s field of view on to the working piece, supporting the operator for orientation[1]. A similarily successful AR application was proposed by Po Chen Wu [7], tracking a pen with calibrated dodeca shaped head with planar QR-Markers in 6Dof . This function is not further discussed in this paper and is only used for defining points during the programming with the AR-stylus.

In this paper the AR environment refers to the output of the AR-Module and serves as the main work environment for the operator. In order to analyse the robot's program, the three use cases highlighted and taken into consideration are as follows : visualisation of robot‘s sequential program, virtual motion simulation of the robot during program execution, and programming procedure of the industrial robot using the AR-Stylus.

II. SYSTEM ARCHITECTURE

The hardware components in the proposed system are a 6DoF KUKA KR10 manipulator, a pneumatic gripper Schunk, a robot controller KR C4 compact and a portable sin¬gle board computer phyBOARD-SeginARM CortexTM-A7. The hardware used for AR as shown in Fig. 1 are as follows : a wearable display Vufine+ mounted with 3MP resolution camera on safety goggles (A), a teaching stylus with remote control buttons (B) and an attachment for camera recognition as shown with a gripper model (C).

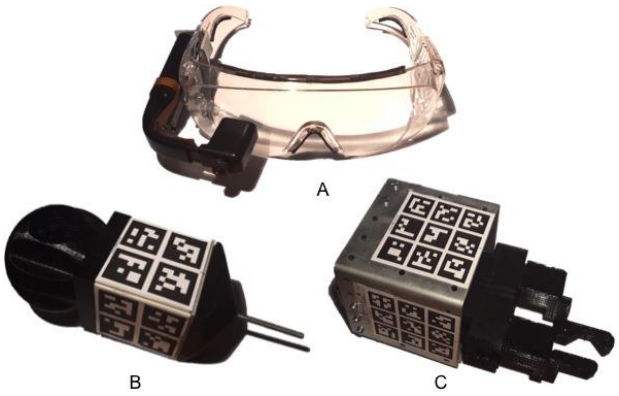

Fig. 1. AR hardware of the proposed system.

The AR-Module acts as a front to the user by projecting information into the operator‘s view within the wearable display. The architecture of the system presented in Fig. 2 is described in detail in the following paragraph.

Using the over-head mounted camera, the operator‘s perspective is determined by using an attachment with the planar QR-Codes mounted on the robot‘s flange. This attachment is further taken as a reference coordinate system for AR projections. The position of the robot‘s flange is frequently transmitted by the controller to the reasoning system and forwarded to the AR-Module. With the help of the AR-Stylus and the remote control buttons on it, the operator programs 6D points to the robot. These points are defined by a camera recog¬nised AR-Stylus position and orientation and is transformed into robots world coordinate system.

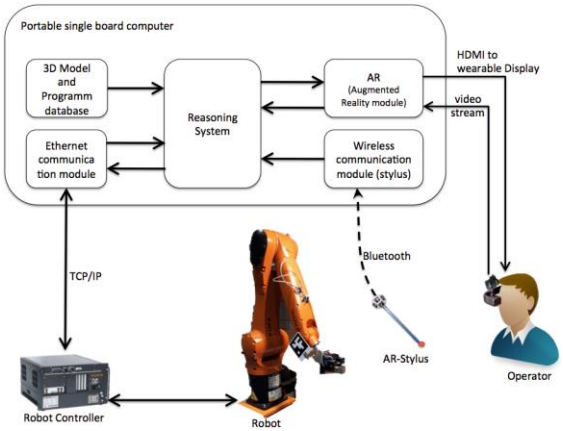

Fig. 2. Hardware and software components of the system.

III. AUGMENTED REALITY ENVIRONMENT

The AR environment consists of a data base, containing all virtual models, e.g. robot's grippers, end effectors and work objects. Furthermore the database con¬tains a backup of robots teached points and trajectories,

represented in the robot's world coordinate system. Thanks to this representation, the object po¬sitions can be easily transformed between coordinate systems (CS), as well into to operators perspective and field of view.

The cameras video stream is reprojected by the AR-Module into wearable display in, that observers field of view is not disrupted by any means. Since the wearable display doesn't covers the entire operator's view, only in this view field area the high informative AR environment is visible. In the respective ap¬proach the determined operators perspective is taken as key reference system for further visualisation and simulation tasks in AR-Module (see CScamera in Fig. 3). An important advantage is, that only additional 3D objects, points and trajectories need to be added to observer's view, instead of simulating the entire environment. This fact can be considered as an advantage, because less processing performance is required for visualisation tasks, as if the en¬tire environment had to be simulated in case of virtual reality. The il¬lustration of Fig. 3 presents an overview of the systems coordinate transfor¬mations and coordinate systems. The homogeneous transformation matrices TMARKER,TTOOL,TSTYLUS-TIP are generally known in the context of initial calibration procedures [8], nevertheless not further considered in this paper. The transformation matrix TFLANGE is given by robot's controller and TCAMERA and TSTYLUS are determined by the head mounted camera, as long QR-Markers are recognised. With the help of the in the paper presented hardware setting a reliable pose estimation for TCAMERA and TSTYLUS was experimentally esti¬mated in a distance between camera to QR-Marker from 0.3 m up to 1.5 m with an measurement accuracy of linear coordinates ±1.5 • 10-1mm, and angular co¬ordinates ±6 • 10-2degree. In the following demonstration scenarios a industrial robot KUKA KR10 R1100 is presented, taking with a conical shaped gripper unmachined pressure casted work pieces off a belt.

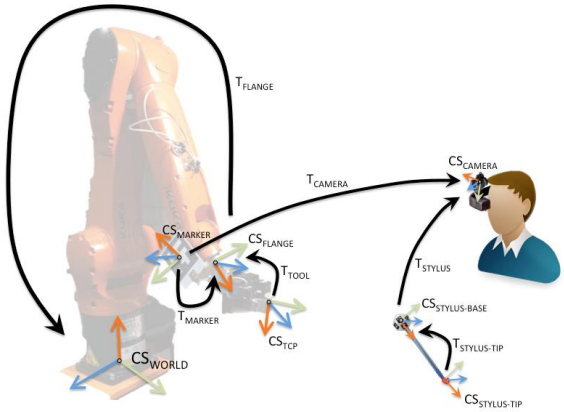

Fig. 3. Overview about homogeneous coordinate transformations in proposed system.

Since the operator's perspective is determined in AR environment, the operator can freely move and observe the target scene from different perspectives for better understanding. With a 3D model of end effector, in this case of grip- per, a real live scaled projection of the model can be embedded into operators view. For simplified simulation proposes, the model could be backed up in sev¬eral conditions, that the appropriate can be chosen. In this meaning a gripping process with moving gripper fingers could be shown in discrete steps. More over a collision evaluation of end effector, moving along the programmed trajectory can be done, observing the simulated model from various perspectives in work AR environment.

The usecase, visualisation of robot program points, will be in the following described. In Fig. 4 is shown, how a visualisation of sequential robot's programs could look like in operator's perspective in AR environment. Points of the se¬lected program are highlighted in color and marked with point name, while points of unselected program's can be displayed as additional information in background colours. This allows to evaluate, how the trajectory would look like in the real work environment, without moving the robot, as in above mentioned traditional procedures of programming industrial robots.

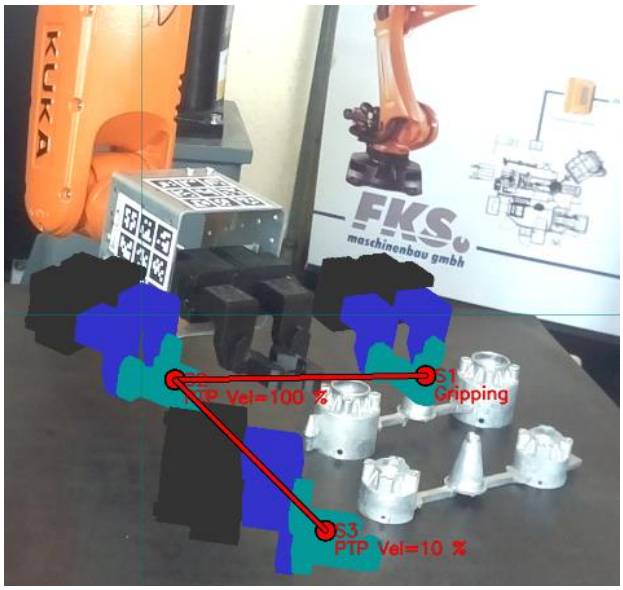

Fig. 4. Visualisation of robot program points.

According to Fig. 3 the trajectory point, represented in robot's world coor¬dinate system, are homogeneous transformed into the recognised marker's coor¬dinate system CSMARKER as follows:

$$S1_{MARKER} = {T_{MARKER}}^{-1} \cdot {T_{FLANGE}}^{-1} \cdot S1_{WORLD} \quad (1)$$

were T_{FLANGE} is given by the robot controller, T_{MARKER} is known in the context of initial calibration in relation to CS_{FLANGE} . T_{CAMERA} is measured by head mounted camera and is called further on, neglecting the fourth row, camera homography matrix H. As example the program point $S1_{WORLD}$ is taken, represented in robot's CS_{WORLD}. It is well known, that the program point S1, represented in CS_{MARKER} of recognised marker as a column vector, can be projected by the homography matrix and other transformations C_{Opt}, describing camera's optical reprojections, into the two dimensional (2D) image plane of operator's wearable display as follows, see Fig. 5:

$$S1_{IMAGE} = C_{Opt} \cdot H \cdot S1_{CAM} \quad (2)$$

where the coordinates of the projected point in 2D image plane are represented as follows:

$$S1_{IMAGE} = \begin{bmatrix} u \\ v \\ 1 \end{bmatrix} \quad (3)$$

The earlier mentioned second use case, simulation of robot motion during executon of sequential program, will be described below.During programming phase of industrial robots, great attention is given to trajectory evaluation in or¬der to achieve collision free robot movement and effective program performance. Programming the robot in offline mode, in simulation tools the entire robot movements can be analysed. In order to achieve accurate simulation results, a detailed model of robot cell must be implemented in simulation environment. As above mentioned, in presented approach, realised only on AR, only additional infomations are embedded into operators view. With integration of 3D models of robot's end effector's or other relevant objects into operators environment, dif¬ferent simulation features can be realised. Since the real scale model of robot's end effector can be projected at every point of trajectory in AR environment, the operator is able to make visual collision checks with surrounding environ¬ment objects. Moreover, introducing a time referenced scheduler for simulating end effector motion along the trajectory points, a real scale movement could be shown in AR environment. For improved simulation quality a dynamic model of the manipulator and a inter point motion simulation should be implemented. In demonstration scenario was shown, how trajectory visualisation during col¬lision check could look like in AR environment. The robot's program consists of 3 points in order to grab the work piece with the conical shaped gripper. In Fig. 6 is the operators view presened, showing a AR overlay in wearable display with the robot's gripper at every of the programmed points as a virtual real scale 3D model. To ensure, no collision of the gripper with surrounding objects would occur during it's movement along the programmed trajectory, the operator can visually evaluate each of the situation from different perspectives.

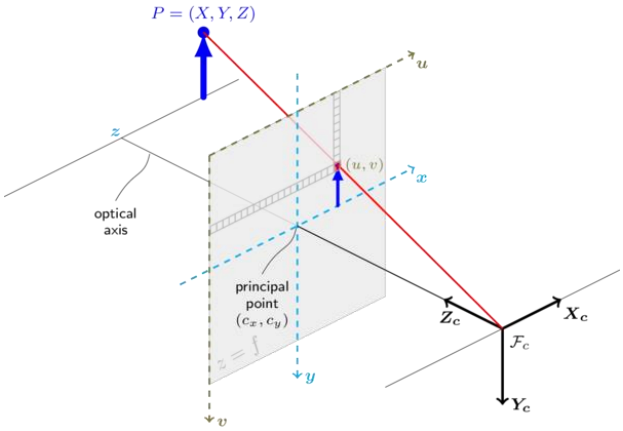

Fig. 5. Illustration of the pinhole camera model. [9]

Fig. 6. Visualisation and simulation of robot motion during program execution.

3.1 Intuitive programming procedure of industrial robot with AR-Sytlus.

A method is needed to allow the operator to define the position and the orien¬tation of the robot's tool with ease, in order to speed up the programming phase of industrial robots. The proposed approach, using a AR-Stylus with buttons which is 6D-tracked by the operator's head mounted camera, could reshape the programming phase more convenient when compared to

using a teach pendant. By pointing the AR-Stylus in the work space of the robot, the position and the orientation can initially be taught to the robot, by pressing one of the buttons. By pressing an AR-Stylus button, the estimated 6D point of the AR-Stylus tip, shown in Fig. 3 as $CS_{STYLUS\text{-}TIP}$, will be transformed by the AR-Module into the robot's CS_{WORLD}, according to the following equation:

$$S1_{MARKER} = T_{FLANGE} \cdot T_{MARKER} \cdot {T_{CAMERA}}^{-1} \cdot T_{STYLUS} \cdot T_{STYLUS-TIP}\,, \quad (1)$$

The AR-Stylus is connected with a portable computer via a wireless connection and is equipped with five buttons which can be preconfigured for various types of programming points. Once a button signal is received, the measured and the assigned point type is sent into reasoning system for reachability checks. If the checks prove to be successful, the point will be added to the robot's program.

In order to increase the user-friendly aspect of the programming interface, the real scale 3D model of the end effector can be projected in place of the AR-Stylus. This provides an effect where the operator holds the robot's tool, which in reality could be humanely impossible to lift, in his hands. Manually guiding the robot by the endefector is actually similar to the programming by demonstartion (PbD) method. In the proposed approach the real robot is involved only as a reference CS for the AR environment and the robot's controller can be switched off. This programming method can be called „virtual programming by demonstration" (vPbD) because a virtual robot is manually guided by the operator. Programming a usual industrial robot by vPbD like a collaborative robot increases the operator's safety in a way and requires no relevant modifications of the robot.

The operator's view in the AR environment with the projected 3D gripper model on AR-Stylus is shown in Fig.7. The projection of the gripper displayed in the AR environment would completely correlate to the real gripper, as though this point was programmed and perceived by the real robot. This feature demands specific orientation skills from the operator and needs to be further investigated in regards to the mental capabilities as proposed by Yuschenko A.S. [10].

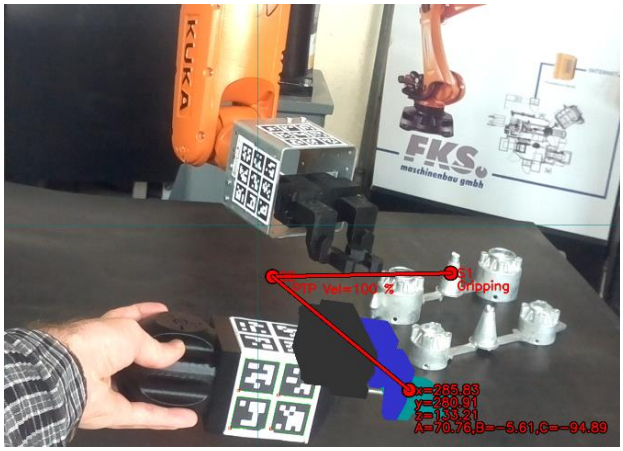

Fig. 7. Programing points with AR-Stylus for sequential program to robot.

IV. CONCLUSION

The system proposed represents an alternative HRI, integrating the operator markedly into the AR environment by using a camera tracking the 6D position of the AR-Stylus and a real-time projection of the 3D robot gripper model virtually substituting the AR-Stylus.

Commerical methods of programming industrial robots are time consuming whereas the AR-HRI is time conserving as well as cost effective.

This presentation carries a few drawbacks that need to be further studied, for example, the accuracy of the visual output from the AR-Module should be thoroughly analysed. In addition to the mentioned simulation capabilities in the AR environment such as the visual check for trajectory collisions, the entire robot struc¬ture should be considered for practical purpose. This proposal which estimates the position of the planar QR-Markers by a single camera, can lead to a lack of accurate 3D projections in situations like the AR-Stylus being partly hidden and the 3D model of the end effector being projected on top of an obstacle. To overcome this shortcoming, a time of flight camera and further algorithms, processing 3D image data should be used. In order to increase the simulation of a robot in the AR environment, a physical model describing the robot's dynamics shall be used for the robot's motion.

ACKNOWLEDGEMENT

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A Review on Process of Interaction between Business Intelligence (Bi) and SMES

[1] Mr. S.S. Bhosale, [2] Dr. R.B. Patil
[1] Research Scholar, [2] Professor.
Department of Computer science and engineering,
[1] Research Scholar, Shri JJTU, Rajasthan, [2] S.K.Somaiya College of Arts, Science and Commerce, Mumbai, Maharashtra, India.

Abstract:-- **Business Intelligence (BI) and SMEs square measure two distinctive analysis domains however larger interaction between these two entities can give the effective learn from one another. This interaction has been taking into account in conducting the dynamic atmosphere. This interaction will solely strengthen individual insights of BI and SMEs, it contributes to the business environmental performance. Though analysis on BI and SMEs is huge to this point, restricted focus was given on learning facet between Bi and SMEs. Therefore, this study is aimed to associate analyses literature and explores an integrated read of literature analyzed on however BI and SMEs learn from one another and contributes to the business environmental performance. A qualitative content analysis was conducted for the procedure that considers forty three articles for information supply. Findings of the literature review recommend enhancing capability of SMEs and new innovation of Bi, which can have an effect on one another. Findings of this study might become helpful for additional analysis in terms of Bi implementation success**

Keywords— Business intelligence; SMEs; modification adaptation; capability; call making; interactive relation; and learning.

I. INTRODUCTION

Business intelligence (BI) has been proliferated thanks to its increasing contribution to like business performance determination, information data warehousing, planning, forecasting, budgeting, and the decision making, and also the higher cognitive process that guides business operation toward desired performance. BI's growing contribution to the business growing performance has been recognized significantly for small and medium enterprises (SMEs) (through up call support. these days BI becomes Associate trend in administering the choice creating for conducting the dynamical atmosphere, and learning to require opportunities rising kind dynamical circumstances.

BI is Associate in information system (IS) crystal rectifier application that integrates the method and technology to guide to the choice creating for managers and finish users. It plays a major role in analyzing the business atmosphere and providing the choice creating in achieving competitive benefits rising from unsure usually changes inside the atmosphere. This business atmosphere is characterized with political science and economic power, complexness of recent data, free market commerce, and high intensity of competition owing to speedy acceleration of technological advancement. The growing rate of technological advancement amplified historic period within the world. Growing effects of data systems, new emerging in technology, speedy historic period, and also the economic process cause business atmosphere is increasingly being more turbulent that is on the far side the management capability of SMEs. Age within the business competition creates new opportunities and threats for businesses that become the problem of business survival and development. Taking opportunities and encountering surprising threats open a challenge for SMEs. Therefore, reviewing and restructuring the business call become on priority.

Despite the economic size of every company, access to relevant and vital info is very important to confirm the success of the acquisition of a market share. Business intelligence is taken into account an awfully vital tool to achieve such a goal. in line with the Gartner's surveys, business intelligence (BI) and analytics systems are stratified because the prime technological priority of corporations within the last years worldwide. The most objective of bismuth systems is to facilitate the choice creating process by providing quality info, based on the analysis of huge amounts of internal and external information. However, BI systems are characterized by their issue and quality to handle. Also, economic factors are those that build several SME's administrations fail to proceed to the acquisition of a system. Normally, the development and maintenance of a bismuth system requires significant funding. Moreover, the majority of SMEs don't have a specialized IT department. Several SMEs are travel by the owners, WHO won't have advanced technological data. it's far-famed that the applications of bismuth aren't primarily accessible to

SMEs. The on the market systems are overpriced, difficult to use and need wonderful technological coaching of business workers.

Commonly, these applications meet the wants of large enterprises that have all the appropriate resources for his or her correct functioning. Despite these limitations, better information provision, expedited by a bismuth system, might result in higher selections and become a regular competitive advantage. A prerequisite is that the self-made confrontation of problems, stemming from the precise characteristics of SMEs. With the evolution of technology, bismuth suppliers have designed and developed applications and tools to fulfill real small businesses desires. There are bismuth systems that are on the market on-line. These systems are affordable, simple and that they belong to the class of cloud systems. Such solutions are appropriate for SMEs, as they are doing not incur extra installation and maintenance value. Tools and IT system applications aren't thought of a privilege of huge corporations, because the services offered are designed for the wants and requirements of SMEs, which might be even as competitive and self-made. The current paper addresses a large spectrum of problems associated with the application of bismuth systems in SMEs. BI practitioners and SME managers may notice this temporary however elliptic account helpful in their makes an attempt to use this up-to-date technology during this specific sector.

II. LITURATURE SURVEY

2.1. SMEs and decision environment:

SMEs square measure outlined as comparatively tiny sized industries square measure (a) actively managed by their house owners, extremely personalized, mostly native in their space of operations, and mostly obsessed on internal sources of capital to finance their growth. SMEs are recognized for his or her growing contributions to a country's economic development. The steady and increasing contribution of SMEs will be seen "in providing financial gain generating activities so increase the speed of growth of real per capita financial gain, balance financial gain distribution and improve economic stability". They need been taking an oversized portion of the planet economic development since Forties However, owners/managers of SMEs unendingly face a spread of problems associated with surprising changes inside the surroundings (e.g. market competition, technological innovation, and business dynamisms).

Rapidity of technological upgrading accumulates new competitors, market, new product, and new business policy in an exceedingly massive network. The quick rate of technological transition creates the supply of uncertainty, world competition, and competitive intensity for businesses. On the opposite hand, competitive intensity influences new nascent within the technological sector, whereas factors like market competition, business policy and world partnership square measure interconnected. In effect, changes in client interests, market demands, pricing, and provide chain management square measure evident. Those changes supply each opportunities (such as flexibility, low value networking, value reduction, and speedy communication (e.g. data security threat, termination of business order), that become the difficulty of business survival and development of SMEs. However, taking opportunities and encountering threats become a challenge for SMEs for adjusting businesses on the far side those changes. Therefore, strategic higher cognitive process appears vital that guides managers during this regard.

The decision creating is outlined because the choice of action and technique managers/organizations use to conduct the ever-changing surroundings related to speedy responsiveness it's associate integrated method of determinative business performance measure, differentiating call issues, assimilative data, prediction business future, and coming up with actions toward the specified performance). For effectiveness of the choice creating, it's vital to know the choice surroundings. The Call surroundings consider the supply of call drawback, call goals, and relevant resources. Therefore, businesses square measure progressively and mostly looking on adequacy and accuracy of data provide chain. Indeed, data management seems vital for the choice creating in SMEs.

Information management refers to managing requiring data provide chain, its assimilation, and its conversion into a meaty type to creates its usability data management provides the substantial approach in satisfying organizations' data primarily based wants. Because, data management provides originating, collecting, storing, recording, analyzing, synthesizing, and remodeling data, that generate information relevant to the choice creating data management integrates 3 application for 3 impacts like technology infrastructure satisfies material primarily based wants, data organization creates its usability, and data administration for its actual use into the choice creating application). Though it's been recognized for the choice creating effectiveness, the study raises a priority to conduct data management in businesses. Thus, IS-led application becomes on necessity which will offer a rigor of data management for and call support. As earlier expressed that metallic element has been meaning as IS-led company application that includes each data management for and therefore the higher cognitive process support.

Eventually, metallic element implementation becomes business imperative for enjoying 2 reticulated roles such data management and therefore the higher cognitive process for amendment adaptation in SMEs.

2.2. Role of BI

Business intelligence (BI) is outlined as "the method of integration knowledge of knowledge of information} from disparate internal and external data sources, applying analysis tools and techniques to know the data inside the info, creating selections, and taking actions supported this gained insight" The importance of metallic element will be imaginary by understanding the queries that why will metallic element continue holding its high rating position and why have businesses not completed the implementation of BI-led application. Incorporation of data from disparate sources, message extraction from given data for and therefore the higher cognitive process creates the worth of metallic element application. The higher than discussion represents that metallic element plays in important role of a company performance management (Richards et al., 2011) by conducting data management and therefore the higher cognitive process organizations would like for conducting the ever-changing surroundings.

With regards to the data management, new and complicated data rising from perpetually occurring changes within the surroundings open a challenge for SMEs. Therefore, organizations need assimilative and process data for sleuthing the degree of effects of these changes which will facilitate organizations to require the dynamic call. Metallic element has been proliferated because of its effective application for scattering, assimilative, and process data businesses use to sense problems associated with the choice creating. For materiality of the choice creating, metallic element as associate IS LED application provides the acceptable level of knowledge accuracy and confidentiality of data that produces relevant information. Information presents concerning what has happened; what's happening and what may happen. The information provides foundation of the choice creating in regard to what to be done and the way. Indeed, metallic element has become evident as logical enabler of data management that's a key necessity of the choice creating.

With regards to the choice creating, metallic element creates the business worth followed by client cooperation, amendment adaptation, and speedy responsiveness to competitive necessities. Moreover, the choice creating provides the value deduction, flexibility of supplying, new technology adoption, business operation regulation Quality data becomes imperative for the standard call. Quality data emerges from a rigorous analysis between historical background and current surroundings. Learning historical context and current scenario provides the $64000 supply of information extraction. Metallic element uses sure technologies to integrate historical and current knowledge recording, synthesizes, knowledge transformation into data, information generation, and its exploitation into the choice creating to enhance the business efficiency. In essence, the discussion represents that metallic element becomes a number one issue of conducting the choice creating related to correct data management. The interrelatedness among metallic element, data management, and therefore the higher cognitive process has been focused with presenting the subsequent.

2.3. Correlation between SME and BI

Wrong or poor call could also be threat of business survival and development. Therefore, metallic element discovers problems associated with the choice creating through managing data) and generates the standard call. However, it's not secure that very same metallic element is appropriate for all industries because, totally businesses have different entities and different views of metallic element performance. Thus, same metallic element isn't appropriate for SMEs as utilized in massive industries. Because, disparate limitation likes variety of staff, annual turnover, investment on IS, and come on investment square measure the factors to contemplate the structure entity of SMEs. Precisely, metallic element formation has to suits SME's structure customary.

In analysis, metallic element provides the choice creating aid SMEs need for conducting amendment adaption in businesses. Further, SMEs need new innovation or reformation of metallic element for requiring new call in conducting new changes occurs inside the surroundings. In distinction, SMEs square measure weakened in terms of needed capability for relevant metallic element implementation. It appears that SME's new call depends on metallic element innovation and new innovation of metallic element depends on SME's relevant capability. Therefore, our study to spot and explore an integrated read of IS literature in regard to however metallic element and SMEs learn from one another, which can contribute to the IS-led business development. Therefore, we tend to conduct a literature review to derive contents relevant to the present study context and make a thematic relation among those contents for distinguishing desired termination of this study.

III. METHODOLOGY

3.1. Study design

Structured literature review discovers the current state of research in the proposed research field and extent to

which more research is needed (Webster and Watson, 2002). We therefore conduct a literature review that offers building a theoretical framework considering a correlation between BI and SMEs, which may contribute to strengthen individual insights of both entities. From this concept-centric literature review we aim to explore cooperative interaction of BI and SMEs and its integrated effects into IS-led business development. As our study conducts the content based analysis for understanding the social view of given contents in subjective manner rather than counting manner, the qualitative content analysis has been conducted for the procedure. Qualitative content analysis integrates thematic views of selected articles and proposes a theoretical framework based on thematic relation. Thus, we considered quality journal and conference databases for reviewing quality articles relevant to the study context.

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3.2. Literature searching

"A complete review covers relevant literature on the topic and is not confined to one research methodology, one set of journals, or one geographic region" Therefore, the topic was screened on the top in searching relevant literature using electronic databases in the field. We tried to use key impactful journals (e.g. MIS quarterly, Information Systems Journal, Information & Management, Decision Support Systems, International Journal of Information Management, communications of the association for information systems, Business Intelligence Journal, Journal of Global Information Technology Management, International Journal of Operations & Production Management, International Journal of Business Information Systems, and so on) and conference proceedings (e.g. IEEE conference, ACIS, Scientific and Technical Information Processing, AMCIS, and AISel). As BI and SMEs are main area of our study, we started literature search using "BI AND SMEs" as primary keyword. It is important to note that prior search offers a number of keyword for following searches. Therefore, our first search proposed a number of keywords such as change adaptation, capability, decision making, interactive relation, learning performance. We used these keywords for searching literature and a number of relevant literatures was finally selected for data sources.

3.3. Literature selection procedure

Literature selection procedure has been conducted by considering insights of searched articles. The summary of article selection procedure has been presented into the following figure 2. Although a number of hits was taken to search relevant articles, 52 articles were downloaded from those hits. All downloaded articles were saved in an individual folder namely "BI and SMEs". Firstly, those articles were screened by conducting abstract review. After critically reviewed of all selected articles, 11 articles were excluded because of not matching exactly to our study context. Remaining 41 articles were primarily selected for the data source, which are closely related to desired findings. A combination of insights and bibliography list of selected articles proposed further search, which added more 2 articles into the pool. Finally, 41+2=43 articles were selected for the contribution to this study.

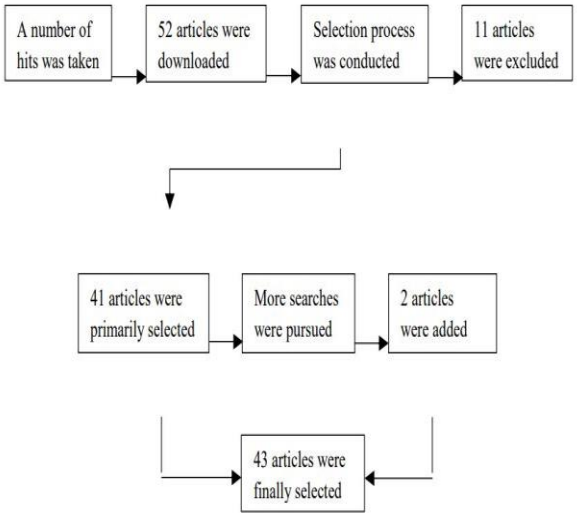

Figure 1: Literature selection process

3.4. Data analysis process

This paper has been guided by (Orlikowski and Barley 2001), in terms of concept generation. (Orlikowski and Barley 2001) focused on epistemological relation between two distinct entities such as information technology (IT) and organization, which interact each other cooperatively. We hired this concept to identify epistemological relation between BI and SMEs as are two entities, which would benefit each other. BI owns merits with such as data warehousing, data mining, message extraction for decision support (Singh and Singh, 2013) and SMEs provide extent to which BI gains access (Grabova et al., 2010). As mentioned earlier that our study looks for how they can be cooperatively interacted that causes improvement of their individual insights and how this interaction causes new contribution into the IS-business domain. Therefore, an integrative data analysis has been undertaken for extracting the current state of knowledge related to above-mentioned desired outcomes within selected sample articles (Smith et al., 2009). Although 43 articles were selected for review, 26 articles were finalized and reported into the following table for content analysis, which is matched through to remaining articles. Paper finalization for being reported was processed based on thematic relation.

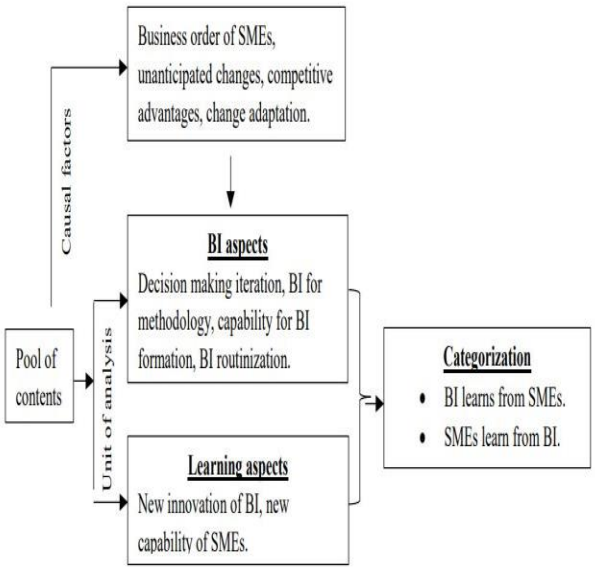

Figure 2: Data analysis and categorization

As shown in 2, given contents in table 1 have been presented into two sets such as causal factors and unit of analysis. Although the first set (causal factors) has not direct contribution to the data analysis, it has been reported into the above figure for focusing why BI is important for the decision making in SMEs. Second set (unit of analysis) represents coded themes derived from given contents, analysis of themes, and abstraction of analyzed themes. The categorization represents the key findings of this study.

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V. CONCLUSION

The aim of this study was to explore an integrated view of previous studies through a theoretical analysis that how BI and SMEs interact each other, which may have positive effects in such as strengthening individual insights of them, improving business environmental performance, and new knowledge generation into the research field of IS. There are two issues were primarily considered in initiating this study. First, SMEs are characterized with disparate limitations, which constrain business hoped performance. Second, uncertain often environmental changes affect SMEs discontinue their business performance order. For new understanding of how SMEs can gain opportunities emerging from those changes offers a study. Therefore, this study has been entailed and attempted to review literature in relation to a theoretical outcomes in this regard.

Our literature review identifies that business owners/managers of SMEs are pursued to undertake new business policy because growing changes within the environment. Rapidity and consistency of new emergent in technology and its rapid effects in industrial revolution cause more turbulent within the current business environment. New and complex information because of technological sophistication creates new changes in such as customer preferences, products and services, supply chain management, business policy, and market strategy. Those uncertain often changes create diverse opportunities and threats, which become the issue of business survival and development of SMEs. However, change adaptation become a challenge for taking opportunities and encountering unexpected threats. Change adaptation necessitates reviewing and reshaping existing business decision that guides managers in conducting change adaption.

The decision making requires an appropriate level of information management. Therefore, two issues such as information management and the decision making have become on necessity for change adaptation. As BI provides corporate performance management (Richards

et al., 2011), our study considered BI implementation in SMEs for conducting information management and the decision making. Therefore, information management capability has logically been recognized for BI implementation. As SMEs have diverse limitation in terms of required capability, our findings suggest attaining information management capability that integrates technological and personnel capabilities for BI implementation in SMEs. Further literature reviewed identified that information management capability depends on organizational capability that integrates firm's resources and insights. From the above discussion, our study has learned that the need of BI implementation for change adaptation in businesses allows SMEs to learn in changing their organizational structure followed by adoption of required capability. Although SMEs learn for BI implementation for the decision making in terms of change adaptation, the consistency of changing phenomena remains a concern.

In order to conduct uncertain often changes, SMEs require new decision. As BI is the best conductor of the decision making, iterating the decision making necessitates the repetition of BI application. Therefore, reformation or new innovation of BI becomes imperative for iterating the decision to conduct occurring changes. Further, SMEs demand different formation of BI as same BI does fit all. In essence, the study has recognized two issues from literature analyzed such as new decision for conducting new changes and organizational entity of SMEs, which raised the issue of new innovation of BI. As a result, BI learns from SMEs.

In addition, our study has also recognized that the interactive relation of BI and SMEs provides the source of learning aspect, which strengthens their individual position. The interactive learning process generates an integrated contribution to the business environmental performance. For example, SME's strong capability causes BI performance in iterating the decision making and new innovation of BI enhances SME's performance in conducting the decision making relevant to change adaptation. Eventually, business environment attains benefits from this interactive relation. In conclusion, our findings suggest enhancing relevant capability of SMEs and identifying appropriate application of BI for achieving competitive advantages emerging from constantly changing environment. Although what type of capability SMEs require has been discussed above, the application type of BI yet to focus. Therefore, further research is suggested in identifying relevant formation of BI application in terms of changes adaptation in businesses.

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A Review on Different Models for E-Learning

[1] Mr. Pujari Vinayak, [2] Dr. R.B. Patil
[1] Research Scholar, [2] Professor.
Department of Computer science and engineering,
[1] Research Scholar, Shri JJTU, Rajasthan, [2] S.K.Somaiya College of Arts, Science and Commerce, Mumbai, Maharashtra, India.

Abstract:-- **This paper is review of the basic models of e-learning process. The different models are implemented different purposes in e-learning. Wide range of e-learning theories and models are evolving day to day according to the domain of e-learning and learning environment. Here we have précised some of the fundamental models which are used by different researchers for educational technology enhancement to take advantage of opportunities to develop effective learning strategies among students for dealing with web information overload and varying information quality. In fact, good teaching implies of course that, in order to develop effective learners, teachers need to be visible. These models plays very important role for e-learning process development and enhancement.**

Keywords— E-learning, Educational Technology web information, information quality, effective learners

I. INTRODUCTION

E-learning is the utilization of data innovation in the instructing and learning process. Instructive innovation is the compelling utilization of mechanical apparatuses in learning. Instructive innovation isn't confined to high innovation .Nonetheless, electronic instructive innovation, additionally called e-learning, has turned into a significant piece of society today. E-learning involves a broad utilization of digitization methodologies, segments and conveyance strategies. For instance, m-learning stresses portability however is generally vague on a fundamental level from instructive technology. Instructive innovation incorporates various sorts of media that convey content, sound, pictures, movement, and spilling video, and incorporates innovation applications and procedures, for example, sound or video tape, satellite TV, CD-ROM, and PC based learning, just as nearby intranet/extranet and online learning. Data and correspondence frameworks, regardless of whether unsupported or dependent on either nearby systems or the Internet in arranged learning, underlie numerous e-learning forms. Models of e-learning portray where innovation plays a explicit job in supporting learning. These can be portrayed both at the dimension of instructive standards and at the dimension of natty gritty practice in actualizing those standards. In this manner the models can be utilized to develop new strategies and to examine improved learning through this methods. This paper outlines some powerful and transformative models utilized for e-learning and improvement of e-learning process.

The use of e-learning and emulsified learning continues to expand significantly in instruction in Bharat currently. There's a desire to know where, once and beneath what circumstances on-line and emulsified learning will be applied effectively and enforced within the teaching and learning method Every student ought to have the interest in knowing what's going on within the category once the trainer is teaching and participate in learning process. The psychological factors like angle and interest are terribly important factors liable for effective learning. The success of on-line and emulsified learning depends on the training level of the scholars. When the scholars develop confidence in their ability to be told and their positive angle modify them to attain high in their language achievement. This study may be a descriptive survey aims at checking out the effectiveness of victimization e-learning on the angle and interest of the students in learning the language. Students from the urban and semi urban areas finding out in engineering schools were designated willy-nilly for the study. The engineering schools were most well-liked to Arts schools as a result of the requirement for improving communication skills is extremely vital for engineering graduates to contend at the worldwide level for varied jobs. Questionnaire containing angle scale and interest scale was wont to collect data concerning victimisation e-learning for enhancing language earning. Knowledge collected was analyzed statistically. The results of the study have discovered that there's a statistically vital distinction (0.05 level) between the urban and semi urban students in victimisation e-learning for enhancing communication skills. Supported the results, the investigator has put forward some suggestions and proposals for enhancing language learning.

1.1 Definition:
The delivery of a learning, coaching or education program by electronic suggests that. E-learning involves the use of a pc or device (e.g. a mobile phone) in how to produce coaching, academic or learning material. (Derek Stockley 2003)

1.2 Importance of E-learning:
E-Learning has completely different edges over ancient learning process. May be either associate degree asynchronous or synchronous activity: historically, e-learning has been asynchronous, which suggests there's no planned time for the training to require place. Everybody will go at their own pace, and take their time to find out what they have to grasp, once they ought to comprehend it. However, a lot of synchronous e-learning is currently being offered through net conferencing and chat choices. The great factor concerning e-learning is it offers you the choice to try and do one, or both.
Includes a world reach: E-learning will merely be placed on-line and simply accessed by folks round the world. There's no would like for dearly-won travel or conferences across multiple time zones.
Spans multiple devices/mobile: on-line courses will work on computers additionally as on mobile devices, such as smartphones and tablets. This implies e-learning courses will virtually be within the hands of the who need them, the least bit times.
Just-in-time/needs-based: It's potential to make, publish, and share a course among many hours. The software is really easy to use that just about anyone will produce partaking courses.
Reduces costs: the entire preceding factors end in a value savings for organizations that use E Learning courses to switch a number of their ancient instructor-led coaching.

1.3 Types of E-learning:
1. Synchronous training
2. Asynchronous training
1. Synchronous, means at the same time,‖ involves interaction of participants with an instructor via the Web in real time. For example – VCRs or Virtual class rooms that are nothing else but real classrooms online. Participants interact with each other and instructors through instant messaging, chat, audio and video conferencing etc. and what's more all the sessions can be recorded and played back. Its benefits are: Ability to log or track learning activities. Continuous monitoring and correction is possible Possibilities of global connectivity and collaboration opportunities among learners. Ability to personalize the training for each learner.
2. Asynchronous which means not at the same time allows the participants to complete the WBT (Web based training) at their own pace, without live interaction with the instructor. Basically, it is information that is accessible on a self-help basis, 24/7. The advantage is that this kind of e-Learning offers the learners the information they need whenever they need it. It also has interaction amongst participants through message boards, bulletin boards and discussion forums. These include computer based training; (CBTs) modules on CD-ROM's, Web based training accessed through intranet (WBTs) or through well written articles and other write ups. Its advantages are:- Available just in time for instant learning and reference. Flexibility of access from anywhere at any time. Ability to simultaneously reach an unlimited number of employees. Uniformity of content and onetime cost of production.

II. LITURATURE SURVEY

Recommendation systems area unit one sort of filtering information and providing the foremost relevant info to the user. This can give recommendation to the users with the information that area unit doubtless of interest to the user. Recommendation systems area unit most ordinarily utilized in recommending product in on-line stores and in division stores. There area unit many researches are performed to provide recommendation services supported user behavior.
Recommendation system is an energetic space of analysis and several studies were performed to use this in recommending books, music, movies, videos, news, and websites for looking information. Within the model planned by the objects area unit counseled supported the calculable ranks of user interest. There area unit four classes of advice system:
i) Rule-based filtering, wherever straightforward rules were used
ii) Cooperative filtering – the users are going to be recommended things that individuals with an equivalent tastes and preferences liked within the past.
iii) Content-based – the users are going to be counseled things that area unit like the one that the user most well-liked within the past. This can offer poor result when the entire users area unit heterogeneous and restricted.
iv) Hybrid system – combines each cooperative and content based approaches. Ontologies are applied to a range of recommender systems to cut back content heterogeneousness and improve content retrieval.

An evolving web-based learning system which might adapt to the open net in response to the usage of its learning materials is planned by artist. Personalization is that the next step in the evolution of eLearning systems. Students will have many cognitive designs that create the

potency Associate in nursing effectuality of an eLearning system completely different with distinct students. Group action the 3 completely different evolution within the space of e-learning area unit pedagogy (learner destined instructional theories), pragmatic (practical solutions to use of educational elements by teachers and educational designers), and technological can be done victimization metaphysics. Metaphysics are often used for knowledge illustration. However in metaphysics we will specify how one topic in connected with different topics and it extremely impossible to incorporate the learners read and rating. Data mining may be accustomed extract the information from E-learning system like Moodle. The course recommendation system in e-learning may be a system that implies the most effective combination of courses within which the scholars have an interest.

Data mining techniques are often accustomed recommend the most effective combination of courses. Some e-learning recommendation systems learn the learners' interest, attitude and need of times, and classify them as low ability, moderate ability and high ability learners and advocate the learning path consequently and a few different learn the learner's interest, perspective and want from their profile. These systems do not worry concerning the quality of the training path to the learner. However it's the very fact that the learners' interest, learning attitude and want can vary from time to time and course to course. During this paper we tend to propose a recommendation system using linguistics web that helps the learners by giving a additional intelligent approach to navigating and looking course content.

III. E-LEARNING MODELS

1. Demand-Driven Model(MacDonald -2001)
2. Strategic e-Learning Model
3. E-learning Acceptance model
4. Instructional design model
5. E-learning Life –cycle model

IV. CONCLUSION

This paper summarizes the generalized models of e-learning. In keeping with the requirement of the analysis study learning necessities, the models may be enforced and integrated. These paper offers transient plan regarding implementation of e-learning models for e-learning be in keeping with theories of e-learning one can study the models for specific analysis work e.g. models for business e-learning, strategic-learning, pedagogic models, web learning models and then on. The comparative study of those models can also be meted out for elaborate analysis and to research values of those models for specific e-learning

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A Review on Business Intelligence and Sme's: Concepts, Components, Techniques

[1] Mr. S.S. Bhosale, [2] Dr. R.B. Patil
[1] Research Scholar, [2] Professor.
Department of Computer science and engineering,
[1] Research Scholar, Shri JJTU, Rajasthan, [2] S.K.Somaiya College of Arts, Science and Commerce, Mumbai, Maharashtra, India.

***Abstract*:-- Business Intelligence (BI) and SMEs are two particular research spaces however more prominent association between these two substances can offer the successful gain from one another. This connection has been considered in leading the evolving condition. This cooperation does just fortify individual bits of knowledge of BI and SMEs, it adds to the business ecological execution. In spite of the fact that examination on BI and SMEs is immense to date, restricted spotlight was given on learning angle among BI and SMEs. Along these lines, this examination is planned to dissect writing and investigate a coordinated perspective of writing broke down on how BI and SMEs gain from one another and adds to the business ecological execution. A subjective substance examination was led for the methodology, which considers 43 articles for information source. Discoveries of the writing survey propose improving capacity of SMEs and new development of BI, which may influence one another. Discoveries of this examination may wind up valuable for further research regarding BI execution achievement.**

Keywords— Business intelligence, SMEs, change adaptation, capability, decision making, interactive relation, and learning.

I. INTRODUCTION

Business Intelligence might be characterized as a "lot of numerical models and investigation philosophies that methodically abuse the accessible information to recover data and learning the board useful in supporting complex basic leadership forms" BI, as indicated by Natasha et al. (2015), can be characterized as a framework joining accumulated date, information stockpiling, and learning the board with investigative devices to introduce complex interior and aggressive data to organizers and leaders.

BI is considered as the capacity to extricate the inward and outside information accessible to an organization, for the objective of supporting basic leadership and improving corporate execution. BI helps chairmen by separating data from different assets in better fundamental authority at both strategic and vital dimension, for standard usage, traditional information structures goodbye, yet for various leveled and useful arranging; new devices are required for business investigation.

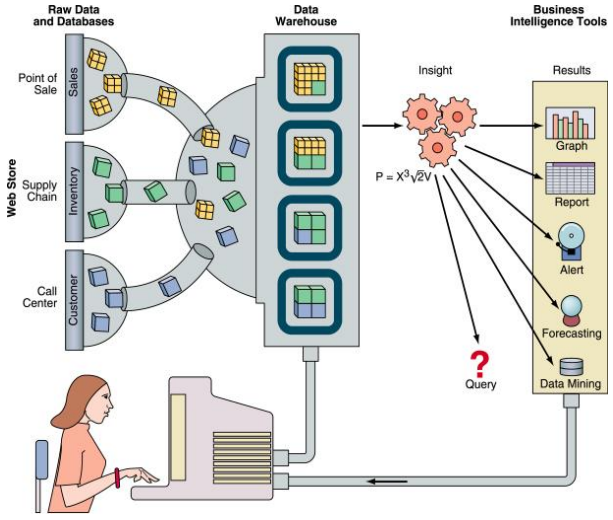

Fig 1: Architecture of BI

The need of SMEs informatization of the information investigation as a center is more grounded and more grounded informatization improvement of SMEs has experienced four fundamental stages: the principal, data distributing. Endeavors distribute presentation and data of items with outsider internet business stage. The second, building an autonomous site, a free space can demonstrate the organization's general impression what's more, quality, E-mail and texting framework are utilized as strategies for interior connection and outer

communication. So the stage Improves showcasing and client responsiveness of a venture. The third, SMEs take part in application administrations, assemble basic budgetary, showcasing and authoritative stage to accomplish office mechanization. With the Internet and online business condition improving, the level of SMEs data bit by bit increments. All the while, the information of SMEs data is to an ever increasing extent, these information originate from the following three viewpoints: Firstly, orders, stock, capital exchanges of the corporate business frameworks; Besides, contender and industry of undertakings which clients and providers work; Thirdly, other outer condition of organizations. The most effective method to extricate data from countless, for example, the connect between the qualities of different sorts of clients and products that they like to purchase, can be found by the examination of offers information, This would be an increasingly precise focused on advancements or give more customized benefits, etc., these techniques make business officials and staff comprehend the execution of each moment of undertakings, help organizations find issues in time and improve the speed and exactness of basic leadership; How to make increasingly successful utilization of data innovation to compose total business arranging, basic leadership, arranging, performing, to accomplish the best procedure of organization tasks. These issues progress toward becoming bottleneck of inside and out use of SMEs data. As the market rivalry condition getting further explicit, lower income, greater expenses and other issues, which are cause by broad administration, have provoked numerous SMEs to move the concentration from key intending to business knowledge, so as to cut consumption and improve proficiency.

Stackowiak et al. (2007) define Business intelligence as the process of taking large amounts of data, analyzing that data, and presenting a high-level set of reports that condense the essence of that data into the basis of business actions, enabling management to make fundamental daily business decisions. (Cui et al, 2007) view BI as way and method of improving business performance by providing powerful assists for executive decision maker to enable them to have actionable information at hand. BI tools are seen as technology that enables the efficiency of business operation by providing an increased value to the enterprise information and hence the way this information is utilized.

Zeng et al. (2006) define BI as "The process of collection, treatment and diffusion of information that has an objective, the reduction of uncertainty in the making of all strategic decisions." Experts describe Business intelligence as a "business management term used to describe applications and technologies which are used to gather, provide access to analyze data and information about an enterprise, in order to help them make better informed business decisions." (Tvrdíková, 2007) describes the basic characteristic for BI tool is that it is ability to collect data from heterogeneous source, to possess advance analytical methods, and the ability to support multi users demands.

Zeng et al. (2006) categorized BI technology based on the method of information delivery; reporting, statistical analysis, ad-hoc analysis and predicative analysis. The concept of Business Intelligence (BI) is brought up by Gartner Group since 1996. It is defined as the application of a set of methodologies and technologies, such as J2EE, DOTNET, Web Services, XML, data warehouse, OLAP, Data Mining, representation technologies, etc, to improve enterprise operation effectiveness, support management/decision to achieve competitive advantages. Business Intelligence by today is never a new technology instead of an integrated solution for companies, within which the business requirement is definitely the key factor that drives technology innovation. How to identify and creatively address key business issues is therefore always the major challenge of a BI application to achieve real business impact.

II. COMPONENT OF BUSINESS INTELLIGENCE

OLAP (Online Analytical Processing): It refers to the manner by which business clients can cut up their way through information utilizing refined devices that take into consideration the route of measurements, for example, time or chains of command. On the web Analytical Processing or OLAP gives multidimensional, abridged perspectives on business information and is utilized for revealing, investigation, demonstrating furthermore, getting ready for enhancing the business. OLAP systems and devices can be utilized to work with information distribution centers or information shops intended for refined endeavor insight frameworks. These frameworks procedure questions required to find drifts and examine basic components. Detailing programming produces collected perspectives of information to keep the administration educated about the condition of their business. Other BI apparatuses are used to store and break down information, for example, information mining and information stockrooms; choice help frameworks and estimating; report stockrooms furthermore, report the board; learning the executives; mapping, data perception furthermore, dash boarding; the executives data frameworks, geographic data frameworks; Trend Investigation; Software as a Service (SaaS).

Advance Analytics: it is alluded to as information mining, determining or prescient examination, this exploits measurable examination strategies to anticipate or give conviction measures on certainties.

Corporate Performance Management (Portals, Scorecards, and Dashboards): This general classification generally gives a holder to a few pieces to plug into with the goal that the total recounts a story. For precedent, a fair scorecard that shows portlets for money related measurements joined with state authoritative learning and development measurements.

Real Time BI: It considers the ongoing conveyance of measurements through email, informing frameworks or potentially intelligent presentations.

Data Warehouse and Data bazaars: The information distribution center is the noteworthy segment of business knowledge. It is subject arranged, coordinated. The information stockroom bolsters the physical spread of information by dealing with the various undertaking records for joining, purifying, and collection and inquiry assignments. It can additionally contain the operational information which can be characterized as an updateable arrangement of incorporated information utilized for big business wide strategic basic leadership of a specific branch of knowledge. It contains live information, not depictions, and holds insignificant history. Information sources can be operational databases, chronicled information, outer information for instance, from market inquire about organizations or from the Internet), or data from the effectively existing information stockroom condition. The information sources can be social databases or some other information structure that underpins the line of business applications. They additionally can dwell on various stages also, can contain organized data, for example, tables or spreadsheets, or unstructured data, for example, plaintext documents or pictures also, other sight and sound data.

An information store as portrayed by (Inmon, 1999) is a gathering of branches of knowledge composed for choice help in view of the necessities of a given division. Money has their information bazaar, showcasing has theirs; what's more, deals have theirs, etc. What's more, the information store for showcasing just faintly takes after any other person's information store.

Maybe most critically, (Inmon, 1999) the person offices possess the equipment, programming, information what's more, programs that comprise the information bazaar. Each office has its very own translation of what a information bazaar should look like and every division's information store is impossible to miss to and explicit to its own needs. Like information stockrooms, information stores contain operational information that helps business specialists to strategize dependent on examinations of past patterns and encounters. The key contrast is that the formation of an information store is predicated on a explicit, predefined requirement for a specific gathering what's more, arrangement of select information. There can be numerous information stores inside an endeavor. An information bazaar can bolster a specific business work, business procedure or specialty unit. An information bazaar as depicted by (Inmon, 1999) is a accumulation of branches of knowledge composed for choice bolster dependent on the requirements of a given division. Money has their information shop, advertising has theirs, also, deals have theirs, etc. Also, the information store for promoting just faintly takes after any other person's information store. BI apparatuses are broadly acknowledged as another middleware between value-based applications what's more, choice help applications, along these lines decoupling frameworks customized to an effective treatment of business exchanges from frameworks customized to an effective help of business choices. The capacities of BI incorporate choice support, online expository preparing, factual investigation, guaging, and information mining. The following are the real segments that establish BI.

Information Sources Information sources can be operational databases, verifiable information, outer information for instance, from statistical surveying organizations or from the Internet), or on the other hand data from the effectively existing information distribution center condition. The information sources can be social databases or some other information structure that underpins the line of business applications. They likewise can dwell on various stages furthermore, can contain organized data, for example, tables or spreadsheets, or unstructured data, for example, plaintext records or pictures furthermore, other interactive media data.

III. ISSUES IN BI

Expert View: Experts see BI in various ways. Information warehousing specialists see BI as advantageous frameworks and are exceptionally new to them. These specialists treat BI as innovation stage for choice help application. The creator is of supposition that to information mining specialists BI is set of propelled choice emotionally supportive networks with information mining strategies and uses of calculations. To analysts BI is seen as a determining and multidimensional examination based apparatus.

Methodologies in Data Warehousing: The principle key to fruitful BI framework is combining information from a wide range of big business operational frameworks into a venture information stockroom. Very barely any associations have an undeniable endeavor information

distribution center. This is because of the huge extent of exertion towards merging the whole undertaking information. (Berson et.al, 2002) accentuates that in perspective on rising exceedingly unique business condition, just the most aggressive undertakings will make supported market progress. The associations will separate themselves by the capacity to use data about their commercial center, clients, and tasks to benefit from the business openings.

Investigation of right data: Several studies counting Gartner, Forrester and International Server farm report that the vast majority of the organizations all through the globe are keen on contributing in BI. It is to be noticed that in spite of major interests in big business asset arranging (ERP) and client relationship the board (CRM) in the course of the most recent decade organizations are attempting to accomplish upper hand. It is because of the data caught by these frameworks. Any corporate would search forward for one objective called 'right access to data rapidly'. Subsequently, the organizations need to help the examination and utilization of data so as to make operational choices. State for checking regular stock or giving certain proposals to clients, firms need right access to data rapidly. Actualizing more intelligent business forms is the place business insight impacts and impacts the base line and returns an incentive to any firm.

IV. FEATURES OF BUSINESS

Insight In these quickly changing world purchasers are presently requesting speedier progressively productive administration from organizations. To remain aggressive organizations must meet or surpass the desires for purchasers. Organizations should depend more intensely on their business knowledge frameworks to remain in front of patterns and future occasions. Business insight clients are starting to request Real time Business Intelligence] or close constant investigation identifying with their business, especially in bleeding edge tasks. They will generally expect up to date and crisp data in a similar manner as they screen stock statements on the web. Month to month what's more, even week after week investigation won't get the job done. In the not very far off future organizations will move toward becoming subject to ongoing business data in much indistinguishable style from individuals generally expect to get data on the web in only one or two ticks. Additionally soon business data will turn out to be more democratized where end clients from all through the association will probably see data on their specific portion to perceive how it's performing. Along these lines, later on, the ability necessities of business insight will increment in the equivalent way that customer desires increment. It is accordingly basic that organizations increment at a similar pace or significantly quicker to remain aggressive.

V. ACKNOWLEDGMENTS

I want to thank all people who help me in different way. Especially I am thankful to my guides Dr. R.B. Patil for him continuous support and guidance in my work.

VI. CONCLUSION

Powerful transaction-oriented information systems are now commonplace in every major industry, effectively leveling the playing field for corporations around the world. To remain competitive, however, now requires analytically oriented systems that can revolutionize a company's ability to rediscover and utilize information they already own. The business intelligence (BI) has evolved over the past decade to rely increasingly on real time data. The BI systems auto-initiate actions to systems based on rules and context to support several business processes. These analytical systems derive insight from the wealth of data available, delivering information that's conclusive, fact-based, and actionable. Enterprises today demand quick results. It is becoming essential nowadays that not only is the business analysis done, but also actions in response to analysis of results can be performed and instantaneously changes parameters of business processes. The paper explored the concepts of BI, its components, benefits of BI, technology requirements, designing and implementing business intelligence, and various BI techniques.

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"A Review on Detection of Sarcasm using Machine Learning Techniques"

[1] Amruta K. Chimote, [2] S.R. Tandan
[1] Research Scholar, [2] Associate professor
[1][2] Department of Computer Science & Engineering, Dr. C.V.Raman University, Bilaspur(CG)

***Abstract*:-- Today in the era of flooding information on online forums, social media where decision making of customer(user) is assisted in all possible ways. Almost all types of applications have their own assistant or chatbots to guide user for his/her query. Use of assistants and chatbots gives real experience and at the same time for admin it is performing the role of customer care executive. To make it more realistic most of assistants and chatbots are built in conversational format which guide user to get correct information. It is necessary to have knowledge of user sentiments while assistance is provided. Sarcasm is one of complex human sentiment which is used to convey disagreement using positive words. This paper provides review on various approaches used to detect sarcasm present in textual data using supervised and unsupervised approaches of machine learning. It is observed many authors used neural networks algorithms to detect sarcasm. Efficiency and accuracy of detection can be increased with combination of different approaches.**

I. INTRODUCTION

1.1 What is Sarcasm? (Some Definition)

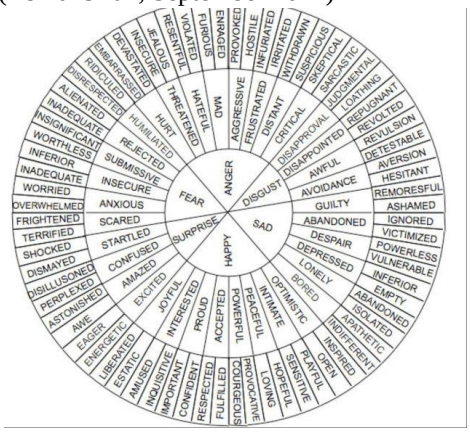
Sarcasm is one of the sentiments representing something positive with negative intent. Sarcasm is defined by so many people with different approach. Some of definitions are :

As said by Mondher Bouazizi Sarcasm is a sophisticated form of irony widely used in social networks and micro blogging websites.

As stated in Cambridge Dictionary by Francesca sarcasm is considered as wit but with high intelligence.

1.2 Sentiment analysis

Sentiment analysis is growing topic in the field of review mining and needed for human machine interaction as well while training any machine regarding human emotions and sentiments. Detection of various sentiments from text/speech will lead to correct decision making. (AshrafUllah, September 2014)



Above is the wheel of sentiments which shows the various sentiments of human, belongs to which category of mood. Sarcasm is one of the sentiments used by people to express their views about people, place, product or any situation over social media. Detection of sarcasm present in any speech/text will be helpful to retrieve correct meaning of sentence, user review and any speech/text available on social media which may influence people to make any decision.

1.3 What is Sarcasm detection?

Identifying sarcasm present in given data of text/speech which may include instructions, blogs, views or reviews is known as sarcasm detection. Sarcasm analysis have become emerging topics of research in opinion mining and sentiment analysis in recent years but most of the work is focused on data in the English language. Detection of sarcasm will further lead to identification of psychology, mood and sometimes health condition of people, which helps in making human machine interaction easier and in some cases it will make diagnosis of brain injuries at early stages. (Katherine P. Rankin et. al 2010 and Mcdonald, Skye et. al 2005). Continuous observation on sarcastic reviews or comments can also help to prevent suicidal cases in youth (Aditya Joshi, et.al.).

2. REVIEW OF LITERATURE:

Wide range of applications are there which based on sentiments, it's obvious so many people get attracted towards this area. As sarcasm is the complex sentiment to identify various researchers contributed in detection of sarcasm in present text. Most of them have focused on

social media text for analysis. Majorly we found that most of work done by using machine learning techniques. Researchers used classification, neural network and combinational approach for this.
Following papers discussed about the classification methods for sarcasm detection.

In the paper title itself sarcastically said that "Detecting Sarcasm is extremely easy " where researchers analysed the performance of system on datasets from Twitter comments and Amazon product reviews. This analysis helped for recommendations for this Methodology Used is Classification Algorithm (Nielsen, June 5, 2018)

Multinomial Naïve Bayes (MNNB)some of the researchers like (P, April 2018) used multinomial naïve bayes (MNNB) and support vector machines approaches of machine learning to detect sarcasm. They used tweets to detect sarcasm.

(Wiken, August 2015) prepared model on detection of irony and sarcasm which classify text into sarcastic and non-sarcastic groups they also used supervised machine learning techniques on amazon and twitter reviews.

It is observed that for better results, neural networks played major role, following papers focused on the use of neural network algorithms such as CNN, LSTM and RNN, etc
(Foster, October 31, 2018) manually annoted a freely available English sentences, where polarity of expressions is classified. To check polarity CNN and LSTM was used by researchers. Series of experiments were carried out for this detection.

In the Paper , "Sarcasm SIGN: Interpreting Sarcasm with Sentiment Based Monolingual Machine Translation " ,authors have interpreted sarcastic sentence into non sarcastic way, focus was given on generation of original sarcasm text into non sarcastic text for this machine translation and RNN used. (Reichart, July 30 - August 4, 2017.)

"Encoding Sentiment Information into Word Vectors for Sentiment Analysis" , This paper focused on following points: (1) feed forward neural network was used to encode lexicons into word vectors .(2) During the training of classifier like CNN ,The word vectors are fine-tuned for supervised training of data and the sentiment lexicon . (Zhe Ye, August 20-26, 2018)
In Contextual based detection of sarcasm some researchers like (Veale, September 7–11, 2017) accurately detect sarcasm based on speaker's mood. This work was carried over tweets leading to new post which is useful cue for detection of sarcasm. Methodology Used are Combination of CNN/LSTM (long short-term memory RNN) .
Sarcasm detection can be made easy if context of statements will be analysed to get correct discourse of the sentences. This will help in auto question answering systems, efficient chatbot and Human Machine Interaction. Following papers speaks about the context driven approach.
In a Contextual Sarcasm Detector (CASCADE), which works on hybrid approach of both context- and content-driven modelling for sarcasm detection in online forums. Further it leads to discourse analysis of sentences. Methodology Used: CNN (Devamanyu Hazarika, August 20-26, 2018)
In Lexicons based sentiment analysis. (Slonim, August 20-26, 2018.) have proposed novel approach to get composition of sentiment from large and not labelled corpus. Authors used unigrams and bigrams on set of lexicons to detect variety of sentiment composition.

Social media is continuously attracting researchers for sarcasm detection, authors explored two methods for representing the context of textual sarcasm detection, Bayesian approach that directly represents authors' natural tendency to be sarcastic, and strong embedding approach that can learn relativity between the author and the text. Methodology Used: RNN with GRU cells. (Y. Alex Kolchinski, October 31 - November 4, 2018)

"Introduction to the Special Issue on Language in Social Media: Exploiting Discourse and Other Contextual Information" ,
In this paper authors simply applying
Some of text mining tools are take into consideration. It focuses on spoken as well as written text. This helps in understanding the more correct meaning of the processed data on social media which further leads to discourse analysis. This helps to understand context from linguistic and computational linguistic point of view. Various NLP approaches are also used on social media text for contextual information. (Farah Benamara)
Previous paper focused on context of text or spoken data, Authors have discovered the context from conversation. Overall concept of conversation is understood using LSTM networks. Context is analysed over social media. Methodology Used: Qualitative analysis of the attention weights produced by the LSTM models (Debanjan Ghosh)

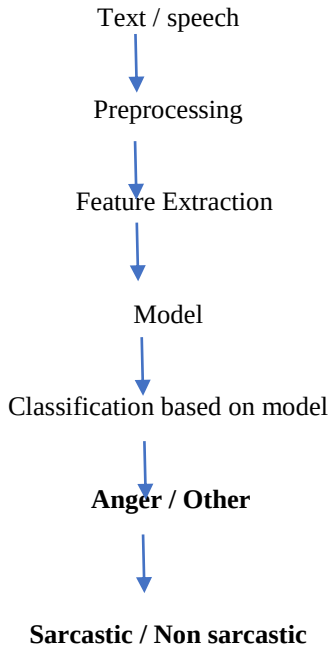
"Reasoning with Sarcasm by Reading In-between", Authors revisit the notion of modelling contrast in order

to reason with sarcasm. More specifically, authors propose an attention-based neural model that looks in between instead of across, enabling it to explicitly model contrast and incongruity. Authors conducted extensive experiments on six benchmark datasets from Twitter, Reddit and the Internet Argument Corpus. The proposed model not only achieves state of-the-art performance on all datasets but also enjoys improved interpretability.
Methodology Used: Multi-dimensional Intra-Attention Recurrent Network (MIARN) (Yi Tayy, July 15 - 20, 2018)

(Taradheesh Bali, December 12 2016) proposed a novel approach to detect sarcasm on social media domain like twitter where context of discussion is understood between two people. This focuses on context discussion between audience and generator of sarcastic views. Lexical and pragmatic approaches are used for this model.

Combinational approach is also used for rhetorical questions, multi-view sentiments corpus data which used SVM and LSTM together for better results by (Shereen Oraby, 15-17 August 2017)
(MessinaMilan, April 3-7, 2017) respectively.
Some of medical science background based papers speak on the detection of brain injuries based on spoken language of surveyed people. Detection of sarcasm can also help medical science to detect injuries, and linguistic development (autism as well) by (Rambam, 2005) (Channon S) (Katherine P. Rankin, 2009 Oct 1)

Scope of work:
Scope of natural language processing is wide enough which leads to Machine Translation, Text Simplification, Spam Filter, Auto-Predict, Question Answering, Natural Language Generation and sentiment Analysis. According to wheel of sentiments, sarcasm belongs to anger segment and that too again classified into critical expression. So, we proposed model which will classify data based on its expression and will precisely classify into sub categories of anger which will lead to correct detection of sarcasm into provided speech/text. Annotation regarding each sub category of anger sentiment will be provided and it will be checked against the model developed.



CONCLUSION:

According to above reviewed work of various authors, it is observed detection of sarcasm a crucial work in linguistic. This will help in serving customer reviews, online discussion forums, chatbots and even detection of brain injuries based on ability of person's writing skill as well.

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An Analysis of Adaptation for E-Learning System by Analyzing Learning Preferences

[1] Mr.Santosh P. Borde,[2] .Yogesh Kumar Sharma
[1] Research Scholar, [2] Professor, Research Coordinator JJTU Rajasthan.
[1][2] Deparment of Computer science and engineering,
[1] Research Scholar, Shri JJTU, Rajasthan, [2] Professors, Head of Department, Research Coordinator Shri JJTU, Rajasthan

Abstract:-- **Personalized learning happens when e-learning frameworks attempt purposeful endeavors to plan instructive encounters that fit the requirements, objectives, abilities, and premiums of their students. The system completes personalized recommendation of the learning content according to the ratings of these frequent sequences, provided by the system. In this System two modules Learning Preferences Acquisition and Interface Component Manage. According to learning preferences, the interface components are changed The more emphasis is on the type of information which users can perceive in better way with respect to Exams, Exercise, Assignments, and Notes etc. b. The system should be concerned about the way of contents and information provided to the user. The results show suitability of using this recommendation model, in order to suggest online learning activities to learners based on their learning style, knowledge and preferences.**

Keyword: E-Learning, Adaptive E- Learning Model, Learning Preferences Acquisition and Interface Component Manage.

I. INTRODUCTION

E-learning is the utilization of data innovation in the instructing and learning process. Instructive innovation is the compelling utilization of mechanical apparatuses in learning. Instructive innovation isn't confined to high innovation .Nonetheless, electronic instructive innovation, additionally called e-learning, has turned into a significant piece of society today. E-learning involves a broad utilization of digitization methodologies, segments and conveyance strategies. For instance, m-learning stresses portability however is generally vague on a fundamental level from instructive technology. Instructive innovation incorporates various sorts of media that convey content, sound, pictures, movement, and spilling video, and incorporates innovation applications and procedures, for example, sound or video tape, satellite TV, CD-ROM, and PC based learning, just as nearby intranet/extranet and online learning. Data and correspondence frameworks, regardless of whether unsupported or dependent on either nearby systems or the Internet in arranged learning, underlie numerous e-learning forms. Models of e-learning portray where innovation plays a explicit job in supporting learning. These can be portrayed both at the dimension of instructive standards and at the dimension of natty gritty practice in actualizing those standards. In this manner the models can be utilized to develop new strategies and to examine improved learning through this methods. This paper outlines some powerful and transformative models utilized for e-learning and improvement of e-learning process.

The main objective of this paper is to study the concept of adaptive learning, to define its dimensions and to analyze the systems developed since 2010. To achieve this objective, we must ask the following questions: What is an adaptive learning system? What is the architecture on which any adaptive e-Learning system is based? What are the approaches that we can use to implement these models and architectures? And finally, what are the typical solutions for each approach?

As of late noteworthy advancement has been accomplished in the formation of e-Learning frameworks dependent on Web-Technologies. During this brief period such frameworks have passed the route from basic hypertext reading material and tests conveyed through WWW to instructive entries incorporating every single instructional asset inside instructive condition. The types of instructional materials have been enhanced generously utilizing media advancements. The remote organization apparatuses for instructional assets, instructive associations and their divisions have developed.

Customarily e-learning frameworks are underlined on the substance age and the greater part of them flop in thinking about the end client, while speaking to it. In this way, shows up the requirement for adjustment to the UI's. Versatile e-learning alludes to an instructive framework that comprehends the learning content and the UI together. End clients have one of kind methods for realizing which may legitimately and in a roundabout

way influencing on the learning procedure and its result. So as to execute successful and productive e-learning, the framework ought to be skilled not just in adjusting the substance obviously to the individual attributes of clients yet additionally focus on the versatile UI as per client's prerequisites. Since e-learning is online instructive frameworks which are fit for gathering immense measures of client profile information, information mining and information revelation procedures can be connected to discover fascinating connections between qualities of clients and the arrangement systems embraced by clients to give suggestions through UIs.

These days, numerous product stages (Learning Space, WebCT and Tool Book) bolster these advancements and make conceivable the fast exchange of instructive substance to e-Learning and offbeat learning with client's decision of this procedure. While some exploration has started to look at the usefulness of e-learning frameworks which had not focused on ease of use issues, specifically to the availability of complex online interfaces. Measures for accomplishing openness by means of specialized details and interface configuration have been set up for the regular Web, be that as it may, it stays to be perceived how far e-learning frameworks are fitting in with these principles, and where the contentions may be between instructive highlights and ease of use.

Normally e-learning of instructive framework gives similar assets to all clients despite the fact that various clients need diverse data as indicated by their degree of information, methods for learning inclinations. Course sequencing is an innovation started in the Area of Intelligent/Adaptive Learning System with the essential intend to give end client/client with the most reasonable grouping of information substance to learn, and succession of learning undertakings (models, work out, issues, substance and so on) to work with. The development of e-learning does not imply that current market items and applications are out of date. Existing e-learning frameworks depend on the amount of data. They neglect to think about a significant factor for the achievement of the framework, to be specific the client.

The versatile UI is fundamental and significant necessity of e-learning frameworks now days, to deal with an individual client. A decent UI encourages successful correspondence between the client and the product. Great plan of such an interface is essential for the achievement of any PC application. Because of this expanding intricacy, makers of Web applications are presented with enormous difficulties to improve the UIs and help clients complete their errands easily. Such rearrangements is testing thinking about the assorted variety of clients as far as age, topography, learning level, etc. An interface that is straightforward for one client probably won't be basic for another. Hence, it is imperative to adjust the UI to various sorts of clients dependent on their profiles.

Versatile UIs likewise make it simpler to consent to the changing principles and guidelines around access control of data. They give greater adaptability to executives in managing such changes. Such versatile interfaces can be utilized in a wide scope of spaces and in an assortment of uses.

The proposed methodology screens the client's activities and attempts to recognize use examples and in like manner modify the interface parts or substance given by the framework. To suit such contrasts in client aptitudes, information and inclinations are imperative to comprehend client's learning style. A versatile UI enables the client to learn various controls by giving direction or specific assistance. A middle of the road option is a blended activity UI, which permits the two sorts of adjustment control: (I) control started by the client (ii) robotized control given by the framework.

II. LITURATURE SURVEY

A. Anitha and N. Krishnan (2011): World wide web is an enormous data source, comprehensively utilized for adapting now-a-days because of adaptability of time, sharing of learning assets and foundation and so on., Most of electronic learning framework needs master student association, evaluation of client exercises and students are getting suffocated by tremendous number of website pages in the learning site and they discover challenges in picking appropriate materials applicable to their advantage. This work endeavors to connect with e-students at a beginning period of learning by giving route suggestions. E-learning personalization is finished by mining the web utilization information like ongoing perusing chronicles of students of comparable premium. The proposed technique utilizes upper estimate based harsh set grouping and dynamic all kth request affiliation principle digging utilizing apriority for customizing e-students by giving learning easy routes. The substance of brushing affiliation principle and bunching is that, utilizing grouped access examples can lessen the informational index size for affiliation guideline mining task, and improves the proposal precision.

Ahmad Baylari, and Gh. A. Montazer (2007): In online instructive frameworks the structure of learning area and substance are normally exhibited in the static way,

without considering the students' objectives, their encounters, their current information, their capacity (known as lacking adaptability), and without intelligence (implies there is less open door for accepting moment reactions or criticisms from the educator when students need support). Accordingly, considering personalization and intelligence will build the nature of learning. In the opposite side, among various segments of e-learning, evaluation is a significant part. By and large, the procedure of guidance finishes with the appraisal and it is utilized to assess students' learning productivity, ability and information. Be that as it may, in online instructive frameworks there is less consideration on versatile and customized evaluation. Having thought about the significance of tests, this paper proposes a customized multi-operator e-learning framework dependent on thing reaction hypothesis (IRT) and counterfeit neural system (ANN) which presents versatile tests (in view of IRT) and customized suggestions (in view of ANN). These specialists add adaptively and intuitiveness to the learning condition and go about as a human teacher which aids the students in a neighborly and customized educating condition.

A. Al-Azawei and A. Badii (2014): This paper researches the instructive premise of Adaptive Educational Hypermedia Systems (AEHS) that consolidate Learning Styles so as to suit client's learning style inclinations and necessities. In this way, AES adjust the learning content, its introduction and route to the client's learning style inclinations. We gather thirty three Adaptive and Intelligent Web-based Educational Systems (AIWBES) that fuse learning styles and examine twenty of them, to be specific the AEHS, as the remaining are Intelligent Tutoring Systems. The fundamental accomplishment of this work is the examination of AEHS' academic premise as far as adjustment rules. We infer that these frameworks pursue comparable examples in their adjustment rationale.

Ali Tarhini et. al (2014): The principle goal of our examination is to (1) exactly research the elements that influence the acknowledgment and utilization of e-learning in Lebanon, and (2) explore the job of a lot of individual contrasts as arbitrators (e.g., age, sex, involvement, instructive level) in an all-encompassing Technology Acceptance Model (TAM). A quantitative strategy approach was embraced in this investigation. To test the guessed research model, information was gathered from 569 undergrads and postgraduate understudies concentrating in Lebanon by means of poll. The gathered information were examined utilizing Structural Equation Modeling (SEM) system dependent on AMOS techniques related to multi-bunch investigation. The outcome uncovered that apparent helpfulness (PU), saw convenience (PEOU), abstract standards (SN) and Quality of Work Life (QWL) decidedly influence understudies' conduct expectation (BI). We additionally found that experience directs the connection between PEOU, PU and SN on e-learning use goal, and that age distinction directs the impacts of PEOU, SN and QWL on BI. What's more, instructive level conservatives the impacts of PEOU, SN on BI, and sex direct the impacts of PU, SN and QWL on BI. In spite of desires, a directing job of age on the connection among PU and BI was not found. Thus, sex was not found to influence the connection among PEOU and BI, and instructive level did not direct the connection between PU or QWL and BI. In light of these discoveries, suggestions to both hypothesis and practice are talked about.

Behram Beldagli and Tufan Adiguzel (2010): Advancement in Internet and sight and sound advances has emphatically affected the effective utilization of e-learning conditions. While expelling the existence confinements made an advantageous learning condition for e-clients, having an assorted group of spectators (various objectives, information levels, foundations or learning capacities) constrained the architects of e-learning frameworks to make versatile and adaptable e-learning situations with the capability of improving the student execution. Despite the fact that e-learning frameworks with adaptively capacities have been created to take care of these adaptability issues by changing the introduction of materials to suit every individual client, they don't fulfill all versatile related needs in principle and application. In this manner, more research and system are should have been ready to utilize e-learning conditions productively as an option in contrast to customary ones. This examination represents potential elements of a perfect versatile e-learning with their definitions and practices.

C. Romero and S. Ventura (2006): Currently there is an expanding enthusiasm for information mining and instructive frameworks, making instructive information mining as another developing exploration network. This paper studies the use of information mining to customary instructive frameworks, specific electronic courses, surely understood learning content administration frameworks, and versatile and smart online instructive frameworks. Every one of these frameworks has various information source and goals for learning finding. Subsequent to preprocessing the accessible information for each situation, information mining systems can be

connected: insights and representation; bunching, characterization and exception recognition; affiliation standard mining and example mining; and content mining. The achievement of the copious work needs considerably more specific work all together for instructive information mining to turn into a develop zone.

Chun-Hui Wu et al (2017): Adaptive learning for individual students has as of late turned out to be well known in instruction. This investigation intends to fill the void in the current writing by structure a versatile e-learning framework with self-evaluation rubrics dependent on the dynamic platform hypothesis because of various understudy needs. In the interim, the reason for this investigation is to investigate the adequacy of utilizing versatile e-learning with dynamic frameworks and rubrics in encouraging understudies' learning results. A test configuration was directed to assess learning adequacy and learning fulfillment in the Excel (spreadsheet) of the course for utilizing the created versatile e-learning framework. Sixty college understudies from an innovation college in focal Taiwan took an interest in this test study and executed a pretest and a posttest. Research results uncovered that the created versatile e-learning framework can viably bolster understudies with customized learning materials and effectively helps understudies procured information and create intellectual capacities. The outcomes suggest that instructors could utilize rubrics as a self-evaluation apparatus for supporting understudies with dynamic platforms to direct a student focused e-learning condition. Moreover, the absence of generalizability is obviously a confinement of the present information because of a couple of members. At last, future research heading of this examination was additionally talked about.

D. Arotaritei and S. Mitra (2004): This article gives a review of the accessible writing on fluffy Web mining. The various parts of Web mining, such as grouping, affiliation principle mining, route, personalization, Semantic Web, data recovery, content and picture mining are considered under the current scientific categorization. The job off fluffy sets in taking care of the various sorts of vulnerabilities/uncertainty is featured. A hybridization off fluffy sets with hereditary calculations (another delicate registering device) is depicted for data recovery. A broad list of sources is additionally included.

D. Pierrakos et. al (2003): This paper is a review of ongoing work in the field of web utilization digging to assist explore on the personalization of Web-based data administrations. The pith of personalization is the flexibility of data frameworks to the requirements of their clients. This issue is ending up progressively significant on the Web, as non-master clients are overpowered by the amount of data accessible on the web, while business Web locales endeavor to increase the value of their administrations so as to make steadfast associations with their guests clients. This article perspectives Web personalization through the crystal of personalization approaches embraced by Web locales and actualizing an assortment of capacities. In this specific situation, the zone of Web use mining is a profitable wellspring of thoughts and strategies for the execution of personalization usefulness. We in this way present a study of the latest work in the field of Web use mining, concentrating on the issues that have been recognized and the arrangements that have been proposed.

F. Doelitzscher et. al. (2014): It has been built up through writing that, if an e-learning framework could adjust to learning attributes of students, it will expand learning execution and substance information obtaining of students. This paper is a fundamental research work for information that set out an establishment for application and execution. We evaluated drifts in versatile e-learning framework improvement, make an informative on learning-style models towards students' learning character and propose an Architectural model of Automatic Adaptive E-learning System (AAeLS) in view of learning-style idea/models. The idea it to display an e-learning framework that will consequently adjust to learning inclination of clients', the framework find out about clients' learning style while the client get familiar with the material substance of the framework; hence the learning procedure in two different ways, the framework is realizing when the client is learning. We prescribe further work on execution and testing of the model, in a connected research.

2.1 Need of work:

1. Design an E-learning application to provide online courses for the specific domain subjects.
2. Capture the learning behavior of an Individual User using Web Usage Mining.
3. Analyze the captured learning patterns and identify the learning preferences of the user in their respective web sessions.
4. Design and validate the adaptation mechanism according to user’s preferences for the specific course.
5. Recommend the adaptation based using rule-based classification

III. METHODOLOGY

The fundamental goal of research is on Adaptive User Interface which incorporates versatile introduction and versatile route for e-learning condition. To accomplish the referenced target the examination is four crease: 1) Identify learning inclinations utilizing Web Usage Mining to recognize diverse utilization examples of clients [3][4]. 2) Depending on the learning inclinations, execute the suggestion framework with versatile UI.
Two Major Modules of Research:
Learning Preferences Acquisition: To display a way to deal with perceive the learning inclinations of individual client as per the activities or routes that the person in question has performed on an e-learning application utilizing Web Usage Mining (WUM). Web log mining is significantly the significant piece of Web Usage Mining calculation which includes change and elucidation of the logging data to distinguish the learning inclinations of clients [11][17]. Eventually these examples are valuable to order different characterized profiles relies upon substance types and to give customized learning condition to the client regarding Adaptive User Interface.

Interface Component Manager: After identifying the categories of users the Interface component manager is changing the graphical representation of user interface based on small applications of E-learning portal.

Benchmark data for validation of the model: E-learning substance is the archive of putting away and organizing the instructional substance in the specific space for example course. The substance obviously ought to adaptively produce for the Interface segment chief. For various clients, the framework should display the suitable data that clients can comprehend as versatile interface. To approve the framework "C Programming Language" Course will think about the benchmark information. For the referenced course various kinds of substance like content, graphical, video, showing, activities and evaluations tests will produce.

IV. CONCLUSION

The significance of proposed structure is to expand average e-learning framework by the usefulness of giving flexibility in UI utilizing learning inclinations. Simultaneously, such a versatile LMS ought not to lose its effortlessness and should keep on being straightforward and simple to use for instructors. So as to give versatility in LMS, the learning inclinations of clients should be known first. Along these lines, a programmed client displaying come nearer from the conduct and activities of clients should be created. The proposed idea permits identifying their client's learning inclinations in a simple way. The distinguished data can be utilized to make clients and educators to mindful the client's learning inclinations, helping clients to more readily comprehend their learning procedures and spurring instructors to broaden their training techniques or materials in the event that they don't bolster distinctive learning inclinations. According to learning preferences, the interface components are changed: a. The more emphasis is on the type of information which users can perceive in better way with respect to Exams, Exercise, Assignments, and Notes etc.

b. The system should be concerned about the way of contents and information provided to the user.

c. Chat application, Email, Discussion Forum are the supportive functions for this type of category.

d. This type of category is specially expecting the proper information access, and also need to concentrate on performance factors of the users.

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Man Is What He Eats: An Investigation on Hinglish Sentiments of YouTube Cookery Channels Using Deep learning

[1] Suraj Kumar Donthula, [2]Abhishek Kaushik
[1] School of Computing, Dublin Business School, D02 WC04 Dublin, Ireland,
[2] ADAPT Centre, School of Computing, Dublin City University, D09 W6Y4 Dublin, Ireland

Abstract:-- **Our study focuses on the sentiment analysis of Hinglish comments by multi-label text classification on cookery channels of YouTube using Deep learning. Multi-layer perceptron (MLP) with different parameters was implemented in our study to investigate the various sentiments in the comments. We have modelled and evaluated MLP by varying the number of neurons, layers, optimizers, activation functions with the various feature engineering methods such as tf-idf, count vectorizer, pre-trained embeddings and customized embeddings. These experiments were conducted on two datasets they are Kabita's Kitchen and Nisha Madhulika's dataset. From the investigation, we concluded Kabita's Kitchen dataset has the highest accuracy 98.53% and Nisha Madulika's has 98.48% accuracy in MLP. This outcome of the experiment was evaluated based on careful analysis on tests conducted during our study.**

Keyword: Cookery channels, Multi-layer perceptron, Hinglish, Sentiment Analysis

I. INTRODUCTION

Food and family are possibly India's two biggest obsessions. In this fast-growing world, many people are leaving their family and moving to cities for jobs, studies and businesses which enable peoples to learn cooking. Though there are many mediums to learn cooking but due to the available access of internet in India lots of people are opting for cookery channels in YouTube. This led to sky rocketed increase in number of cookery channels based on Indian food. Therefore, there is increase in competition for youtubers to satisfy the viewers by creating good quality content. To grow as a successful channel, interaction between the users and creators is more important and specially for this cookery channels because the result of following cooking from a cookery channel is instant, this leads to a lot of doubts while in process. These comments are one the social metrics that will help your video to be ranked higher in the search engine result if you get more of it. It's one of the factors that affects it other than watch time, views, likes and many others.

Comments are very important as it gives the content creator a way to communicate with its viewers and subscribers. It's very important to maintain the relationship between content creator and its viewers. The social interaction that mainly being used is the comment section. It's also provided a way for the content creators to get fresh new ideas of the future content. It will help you to improve your social skill and give the opportunity to appreciate and reward you viewers for their supports to your videos and channel. This persuaded us to perform research on Indian cookery channels and discover approaches to help the youtubers and suggest them solutions to for interactivity [1]. During our literature review we found a study has been conducted on the cookery channel by creating and training dataset using machine learning models to comprehend and examine the user's necessities from the video. We took that study of Gagandeep et al. as a baseline model and applied deep learning MLP models with different parameters on the similar dataset to improve accuracy [1].

Sentiment Analysis is a field of Natural Language Processing (NLP) that develops a framework which is used to recognize and extricate judgement inside content [2]. With the assistance of this frameworks, this unstructured data could be naturally changed into organized information of general sentiments about items, administrations, brands, legislative issues, or any theme that individuals can express feelings about. These writings are normally troublesome, tedious and costly to investigate, comprehend, and sort through. Aside from the feelings, for sentiment analysis language additionally assumes a significant job, as a rule remarks by individuals are in blend of different dialects. This Multilingual feeling examination can be a troublesome assignment. Ordinarily, a great deal of pre-handling of data is required which is one of the difficulties.

Comments under cookery videos are generally in Hinglish which means Hindi language written in English content with numerous words from English jargon. Since Hinglish essentially addresses mapping the information from English to any morphological language doing sentiment analysis is an unprecedented test. The absence of assets for the Hinglish language brings difficulties going from storing up to time of datasets. We reacted to this test and dealt with the Hinglish language.

This study is partitioned into different sections such as literature review, methodology, results, discussions and conclusion. Literature review includes the previous work done on the sentiment analysis, text classification using machine learning and deep learning. Methodology incorporates the information about the process followed, type of feature engineering and about the model and its parameters used to increase the accuracy. In results, we provided the results obtained by the model with various combinations of parameters with different types of vectorizers are presented. In discussion, we discussed about the outcome has been outlined in discussion section. In conclusion we concluded the work which we have done.

II. LITERATURE REVIEW

This section is a review of the studies related to the sentiment analysis and text classification approaches, therefore, in this we discuss and compare some of the research topics, applied techniques, feature selection methods, limitations, computational difficulties and model performances.

A. Deep learning and decision trees approach used for Sentiment analysis

This paper exhibits the new approaches of deep learning and decision trees to deal with the movie reviews for Sentiment analysis [3]. The data set used consists of 50,000 IMDB movie reviews, specially selected for sentiment analysis. random forest and deep learning method such as deep recurrent neural networks are used for the message classification. The bag of words model with random forest gives an accuracy of 85.2% and deep learning (i.e., recurring neural networks) gives an accuracy of 90.3%. The given work shows that surface analysis of a text is not enough for sentiment analysis. Of course, simple methods can be used for systems where high speed and resources are important. But for results-oriented services it would be not enough. Information [3].

B. Detecting inappropriate comments by Text Classification.

In this paper, process involves performing text analysis when a user posts a comment on certain article and judge whether a comment is good or bad [4]. They used natural language processing to identity inappropriate content and compared a group of algorithms and assess distinctive capabilities to show signs of improvement precision for characterization. Swedish language data set manually labelled by two students at LTH and English language data set from a Kaggle competition detecting insults in social commentary are used for this process [4]. By using different feature selection and applying the machine learning algorithms by different combination they got results and thus found that SVM and logistic regression are performing similar, however logistic regression scored slightly higher and has the advantage of providing a probability score describing the certainty that a comment belongs to one of the two classes.

C. Classification of Political logs Sentiment by Mining

This project deals with the web-logs data and discusses the prevailing techniques and their usage for sentiment classification. The data is extracted from the website1, which is political web log. Naive Bayes and Support Vector Machines are the algorithms used for this classification. They conducted the experiment by creating 5 collections, four are classified by Naive Bayes and the remained by Support vector machines. Each collection is used to evaluate the effectiveness of known aspect of the sentiment classification [5]. On an average we get accuracy for Naive Bayes as 78.06% and for Support Vector Machines it is 75.47%.

D. Automatic web page categorization using text classification methods

The goal of this thesis is to use Natural language processing and Machine learning tools for the text classification to implement the web-page categorization [6]. This process involves extracting textual, natural language content from web page, encoding the document as a feature vector with natural language processing methods. Data from `Whaam' on which user stores links of different categories, has used for this project. Data in a webpage is divided accordingly as per development of webpage and classifications applied on every division. Support Vector Machines (SVM), k-nearest neighbor (kNN), Multinomial Naive Bayes (MNB), Term-Weighted Complementary Naive Bayes (TWNCB) and the Cavnar-Trenkle N-Gram-based Classifier (N-Gram) are the algorithms used for implementing the classification. The results show that they are not terrible,

suggesting that with the honing of these methods leads to increase in the success rate [6].

E. Classification of comments with Deep neural network based on attention mechanism

This paper proposes a CNN-Attention network based on Convolutional Neural Network with Attention (CNNA) mechanism in which all, information between words for context can be expressed by using different sizes of convolution kernels after this, an attention layer is added to convolution network to obtain semantic codes which has the attention probability distribution of input text sequences [7]. Furthermore, weights of text representing information are calculated and finally, the SoftMax is used to classify emotional sentences. It is proposed because it is very difficult to represent the text information with shallow network, and it is time-consuming for using deep neural network[7]. In this method the features of different context information can be extracted thereby reducing the depth of the network and the accuracy is improved. The dataset used is the COAE2014 task 4 weibo data set. The outcome of this study tells that the Text semantic information and text features are extracted using bottom layer and experimental results should that the performance of the model is 95.15%.

F. An Experimental Comparison of Text Classification Techniques

A lot of important status is given to archives management as there is skyrocketing of documents in computerized structure and the resulting need to get to them in adaptable ways. So, text classification field became the one of the more centered arenas in AI research. One of the key procedures used to deal with and sort out content information is text classification which is the undertaking of marking common language writings with topical classifications from a predefined set [8]. The main aim of the thesis is to compare the performance of current text classification techniques, from standard SVM-based, statistical and multilayer perceptron (MLP) models to the deep learning models such as convolutional neural networks and their combination with graph theory[8]. Rotten Tomatoes, 20 Newsgroups and Reuters data of Volume 1 are the datasets used for this comparison. They concluded two results that convolutional neural networks with graph theory perform with greater test accuracy when compared to classical CNNs, SVM-based models and statistical baseline models. Second, and more surprisingly, simpler MLP models still outperform recent deep learning techniques despite having fewer parameters.

G. Spam detection in online social networks by Deep learning

The aim of this thesis is to detect the spam in the social networking sites by using deep learning approaches. In this Word2Vec is used for feature selection and then deep learning methods are used to distinguish the spam and the no spam tweets [9]. For the dataset, they collected 5-days tweet data from Twitter's Streaming API. The dataset contains about 10 million tweets. These tweets are processed by JSON designing and every line in this work is handled as a target. Different measures such as Precision, Recall, and F-measure are used to evaluate the performance of the methods[9]. Multilayer Perceptron, Random Forest J48 and are the algorithms used for the classification. The results show that the precision value of Multilayer perceptron MLP is 92%. The worst result of this measure is obtained by Naive Bayes Classifier. The process on these tweets exhibit that of this deep learning approaches outperform the classical approaches.

H. Sentiment Classification: Feature Selection Based Approaches Versus Deep Learning

This paper compared the performance of feature selection-based approaches and deep learning architecture, convolutional neural network, long short-term memory network, and long-term recurrent convolutional network. For text classification, traditional method for feature selection such as bag-of-words is used, these features are given as input to the model such as Support Vector Machines (SVM) and neural networks. The hindrance to the bag-of-words feature selection method is enormous loss of data during preparing stage since the document depends on the recurrence of a word which doesn't consider the significance and order of the words with low frequency, so to conquer this issue a new technique called word embedding has been developed for text mining [10]. In this paper experiments are conducted on 4 datasets which are having different characteristics they are IMDB movie review dataset, subset of Sentiment140 dataset, Nine Public Sentiment dataset consisting of positive and negative reviews from such domains as laptop, music etc. and Multi-domain dataset which contains reviews collected for many different products of Amazon.com reviews. For analyzing deep learning techniques used are convolutional neural network, long short-term memory network, and long-term recurrent convolutional network and for feature selection approach, a hybrid method which combined bag-of-words features and averaged word embedding features are used. At first, they classified using SVM Classifier for both feature selection models and then deep learning models and hybrid deep learning models are

used. The results show that at least one deep learning model outperform all feature selection-based methods. The hybrid model here it is CNN+LSTM is the best performer among all for IMDB dataset, CNN performs best than the other methods for nine public sentiment and multi-domain dataset. The only dataset where IG and Word Embed-dings given better results is on Sentiment140 dataset. They concluded that we can achieve more better results in sentiment classification by using deep learning models with fine-tuned semantic word embed-dings [10].

I. Research on hot news classification algorithm based on deep learning

Now-a-days people are more interested towards the hot problem in news because of the advancements in the arena of network applications. So, there is need to classify the hot problem in the news. This proposal aims to study the various deep learning approaches in text categorization, combined with the characteristics of the news text, put forward the double Bi-Gated Recurrent Unit (GRU) + attention deep learning model to predict the hotspots. Since the methods such as Many methods based on machine learning, such as Naive Bayes, Support Vector Machine (SVM), classification tree and vector-based features, cannot study the semantics the accuracy of the classification is not high. Due to this kind of issues and increase in the sub-fields the classification has become more challenging. This paper proposes a new hybrid deep learning model, which can be used for text categorization, namely BiGRU + attention mechanism. This method has higher precision when compared with the classical approaches of text classification because of considering the full context of data and focus problems. The data is fetched from the sohu website crawl, dated from October 20, 2015 to April 25, 2016, includes financial news, social news and other hot news from sohu buzz [11]. The outcome show that the predicted results of our model are superior to the traditional model of deep learning. This method has higher precision when compared with the classical approaches of text classification because of considering the full context of data and focus problems [11].

As per the literature review studied, researchers worked on detecting positive and negative comments and mostly binary text classification whereas our study is related to sentiment analysis by implementing multi label text classification. We also found that more research has been done on a single language, and very few works has been done on a mix of two languages. While conducting a research we discovered a similar research has been already done by Gagandeep et al. on cookery channels of YouTube and achieved highest accuracy of 76.56%. In this research of Gagandeep et al., clustered a dataset by using API and sentimental analysis has been performed by using machine learning algorithms. Now we considered Gagandeep et al. models as baseline models and implemented neural network-based model multi-layer perceptron with different parameters to increase the performance.

III. METHODOLOGY

In this section, the process followed for sentiment analysis by multi-label classification is discussed.

A. Dataset Preparation

As our aim is to increase the performance of baseline models which is achieved in Gagandeep et al. paper, we also used the same datasets. The data set [12] is downloaded link which is created by Abhishek et al.

The dataset contains the pre-processed (removal of stop words, empty values, numbers, special characters and punctuation, converting into lower case, tokenization and stemming [1]) Hinglish comments of top cookery channels, named Nisha Madhulika Cooking Channel and Kabita's Kitchen.

The dataset was divided into seven categories with an equivalent number of trails, 700, each. The total data in all the datasets is 9800 [1].

Downloaded glove.twitter.27B.200d embedding and used for feature engineering.

According to the Gagandeep et al. paper there are seven categories of comments such as

Label-1 Gratitude
Label-2 About recipe
Label-3 About video
Label-4 Praising
Label-5 Hybrid
Label-6 Undefined
Label-7 Suggestion or queries

The initial step in this is selection of data, loading a dataset and performing basic pre-processing steps. The dataset is then splitted into train and test sets.

Downloaded glove.twitter.27B.200d embedding data also and used as part of feature engineering.

B. Feature Engineering

It is the most significant step in the text classification. In this the dataset is converted into flat features i.e., by converting the data into a matrix used to train a model. This progression likewise raw incorporates the way toward making new highlights from the current information.

In this, information will be changed into feature vectors and new features will be made utilizing the current dataset. We will execute the accompanying various thoughts to acquire important features from our dataset.
Count Vectorization: It is a matrix notation of data in which there are different types of representations, in this row represents a document, column represents a term and cell represents a count of frequency in a document [13].
TF-IDF Vectorization: It represents the general significance of a term in the archive and the whole corpus. The features weighting mechanism commonly used are as Term frequency and inverse document frequency (TFIDF). Kaushik et al. described in detail about the features weighting mechanism techniques and consequence in machine learning model [13].
TF-IDF score is made by two terms: the first figures the standardized Term Frequency (TF), the subsequent term is the Inverse Document Frequency (IDF), registered as the logarithm of the quantity of the reports in the corpus divided by the quantity of documents where the particular term shows up.
Word Embedding: A word embedding is a form of representing words utilizing a thick vector portrayal. The situation of a word inside the vector space is found out from content and depends on the words that encompass the word when it is utilized. Word embeddings can be prepared utilizing the information corpus itself or can be created utilizing pre-prepared word embeddings, for example, Glove, FastText, and Word2Vec.

C. Model Training

The last step in the classification system is to prepare a classifier utilizing the features discovered in the previous step. There are a wide range of decisions of machine learning models which can be utilized to prepare a final classifier. Our aim to compare the performance of multi-layer perceptron in multi label text classification with the traditional baseline machine learning models [10].
Multi-Layer Perceptron: MLP is a feedforward artificial neural network that generates a set of outputs from a set of inputs. An MLP is characterized by several layers of input nodes connected as a directed graph between the input and output layers. It is a field that explores how basic models of brains can be utilized to illuminate troublesome computational assignments like the predictive modelling as we find in machine learning.
Networks of Neurons: A layer has multiple neurons and a network has multiple layers. These neurons are masterminded into system of neurons. The arrangement of neurons in a network is called the network topology.
Input Layers: The base layer that takes input from your dataset is known as input layer, since it is the uncovered piece of the system it is also called as visible layer. Regularly a neural system is drawn with a visible layer with one neuron for every information in your dataset. These are not neurons as depicted above, however basically pass the info esteem through to the following layer.
Hidden Layers: Since these are not directly exposed to the input these are called Hidden layers. The basic architecture of neural network to have a single neuron in the hidden layer that directly outputs the value.
Output Layer: The layer which is known for providing a output by a vector that required for the issues is the final layer called as output layer.
Activation Function: The weighted sources of info are summed and went through an actuation work. It is a basic mapping of summed weighted contribution to the output of the neuron.
When output is 0 and 1 we use a non-linear function like logistic also called the sigmoid function, when the output is in range of -1 and +1 we use tangent function called tanh.
More as of late the rectifier activation function has been appeared to give better outcomes.
Loss Functions: Loss function is a significant part in neural systems, which is utilized to gauge the irregularity between predicted and actual labels. It is a non-negative value, where the power of model increments alongside the diminishing of the estimation of this function.

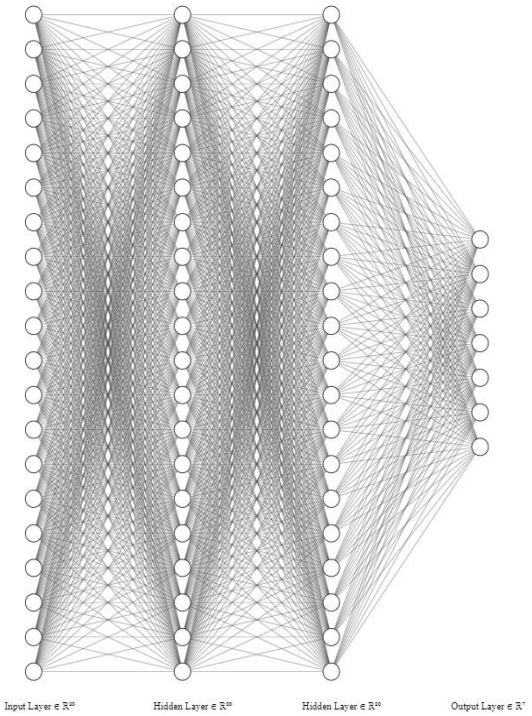

Figure 1- Multi layer Neural Network with 4 layers 20 neurons per layer and 7 neurons for output layer

IV. RESULTS

When a neural system has been prepared it very well it can be utilized for the classification. You can group the test data to assess the performance of the model on concealed information. The system topology and the last step of weights is all that you must spare from the model. The outcome of this experiment was obtained by Multi-layer perceptron over both the datasets using different feature vectorizers like count, tf-idf vectorizer, pre-trained embeddings and custom embeddings . The Experiment is conducted on Multi-layer perceptron with different combinations of parameters such as layers, number of neurons, activation, optimizer functions. The metrics used to is accuracy.

On Kabita's dataset the outcome we get that Multi-layer perceptron with count vectorizer with optimizer and activation function as 'adam' and 'tanh' has the highest accuracy 98.53% (Table-1). It is very close to TF-IDF vectorizer with optimizer and activation function as 'adam' and 'leaky relu' with 98.13%. Count vectorizer has an average of >90% with all the combinations of parameters. Optimizer 'adam' gives an average accuracy of >90% whereas 'sga' optimizer gives accuracy of <60%. Comparatively Embeddings also gives less accuracy than tf-idf and count vectorizer.

Table 1: Results on Kabita's Kitchen dataset.

Model	Layers	Neurons	Optimizer	Activation	Accuracy
count vectorizer	2	20	adam	tanh	98.39
	3	20	adam	tanh	98.39
	3	20	adam	leaky relu	98.48
	3	15	adam	tanh	**98.53**
	3	20	adam	tanh	**98.53**
Tf-idf	2	20	adam	tanh	97.78
	3	20	adam	tanh	97.81
	3	15	adam	tanh	97.84
	3	20	adam	relu	97.99
	3	20	adam	leaky relu	**98.13**
Pre-trained embeddings	2	20	adam	tanh	77.2
	2	20	adam	leaky relu	77.25
	3	20	adam	leaky relu	78.16
	2	20	adam	relu	78.27
	3	20	adam	relu	**78.54**
custom embedding	2	20	adam	leaky relu	88.24
	3	20	adam	leaky relu	89.48
	2	20	adam	tanh	89.69
	2	20	adam	relu	89.69
	3	20	adam	tanh	**89.91**

On Nisha's dataset we found the similar results, multi-layer perceptron with count vectorizer with optimizer and activation function as 'adam' and 'tanh' has highest accuracy 98.48% (Table-2). For the same parameters with Tf-idf we got an accuracy of 98.22%. On this dataset both tf-idf and count vectorizers show an average accuracy of >90%. Similar results are also observed in case of embeddings i.e., less than tf-idf and count vectorizer.

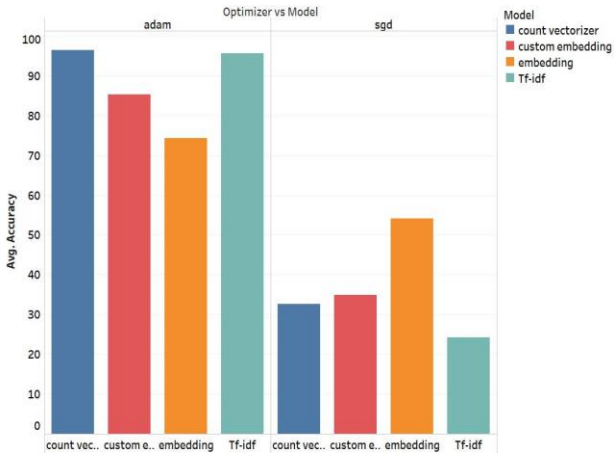

Figure 2- Bar graph showing accuracies on Kabita's dataset using tf-idf, count frequency vectorizer, pre-trained embedding and own embedding with their optimizers.

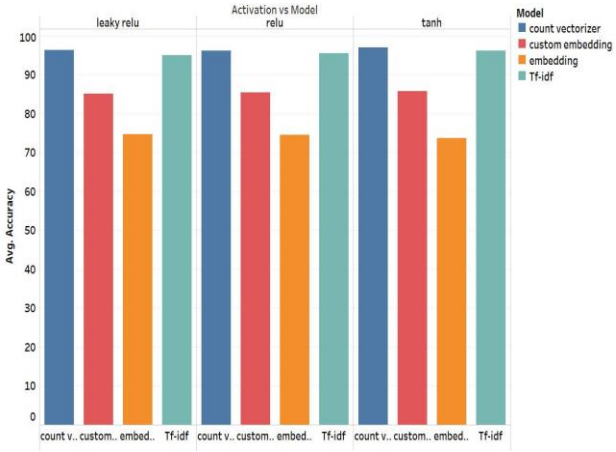

Figure 3- Bar graph showing accuracies on Kabita's dataset using tf-idf, count frequency vectorizer, pre-trained embedding and own embedding with their activation function.

Table 3- Results on Nisha Madhulika's dataset.

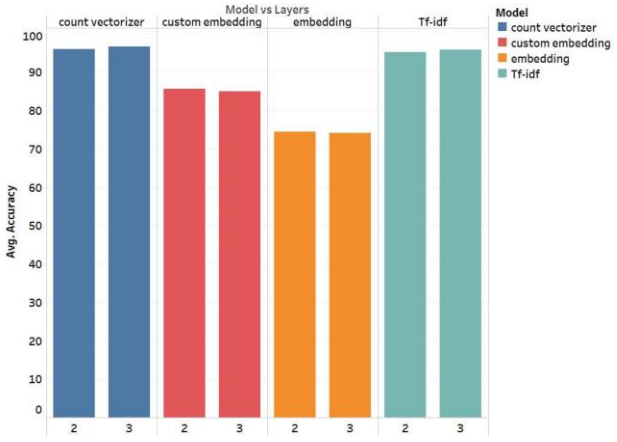

Figure 4-Bar graph showing accuracies on Kabita's dataset using tf-idf, count frequency vectorizer, pre-trained embedding and own embedding with their Number of layers.

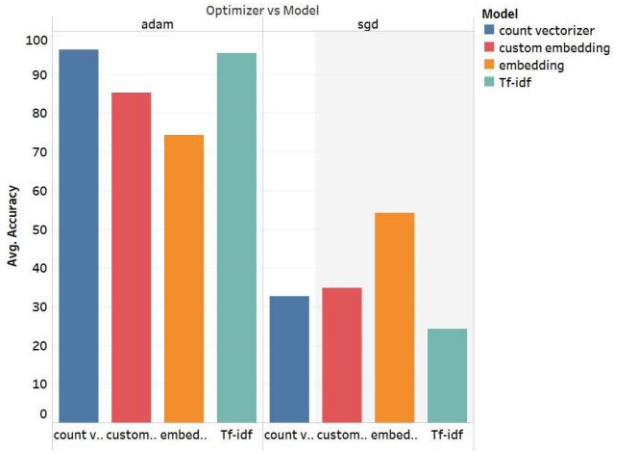

Figure 5- Bar graph showing accuracies on Nisha Madhulika's dataset using tf-idf, count frequency vectorizer, pre-trained embedding and own embedding with their optimizers.

Table 2: Results on Nisha Madhulika's Kitchen dataset.

Model	Layers	Neurons	Optimizer	Activation	Accuracy
count vectorizer	2	20	adam	leaky relu	98.23
	3	15	adam	tanh	98.29
	3	20	adam	relu	98.39
	3	20	adam	tanh	98.42
	3	20	adam	tanh	**98.48**
Tf-idf	3	20	adam	relu	97.93
	2	20	adam	tanh	98.02
	3	20	adam	tanh	98.1
	3	20	adam	leaky relu	98.1
	3	20	adam	tanh	**98.22**
Pre-trained embedding	3	20	adam	relu	77.17
	3	20	adam	leaky relu	77.34
	2	20	adam	tanh	77.63
	2	20	adam	leaky relu	77.93
	2	20	adam	relu	**78.77**
custom embeddings	2	20	adam	tanh	89.73
	2	20	adam	leaky relu	90.34
	3	20	adam	relu	91.2
	2	20	adam	relu	91.38
	3	20	adam	tanh	**91.83**

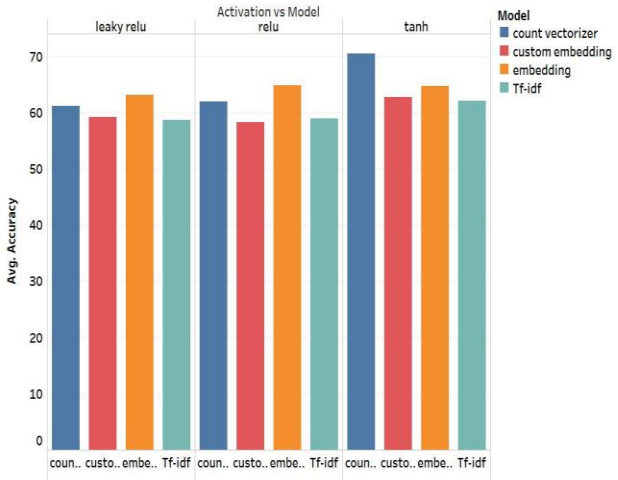

Figure 6-Bar graph showing accuracies on Nisha Madhulika's dataset using tf-idf, count frequency vectorizer, pre-trained embedding and own embedding with their activation functions.

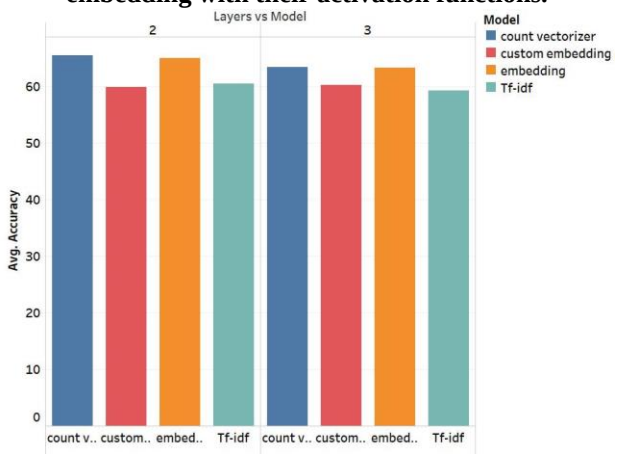

Figure 7-Bar graph showing accuracies on Nisha Madhulika's dataset using tf-idf, count frequency vectorizer, pre-trained embedding and own embedding with their number of layers.

V. DISCUSSION

The objective was to locate the best MLP which gives higher performance than the baseline models and, in view of our examination, it was discovered that the Multi-Layer perceptron model performed better on both the datasets. Numerous examinations have been finished on machine learning and deep learning models on sentiment analysis and content classification but in this we used multi-layer perceptron with different combinations of parameters and made comparisons on them. The purpose for utilizing these models was to check how a neural network model works on Hinglish comments multi-label text classification.

From the results the outcome we get that tf-idf and count vectorizer gives a highest accuracy. We also found less performance in case of word embeddings because our research is based on Hinglish comments and we use English pre-trained embeddings and embedding from our corpus also gives low accuracy because of the dataset size.

As per experiment conducted on different parameters, we have visualized the results, we have made visualizations with average accuracy and parameters used on both datasets. From the visualization (Figure-2 & Figure-5) we can say that 'adam' optimizer gives better results on both the datasets. From (Figure-3 & Figure-6) we can also conclude that the performance of activation function depends upon the feature engineering techniques because the (Figure-2 & Figure-5) shows different accuracies for all the activation functions. We also observed that increase in the layers (Figure-4 & Figure-7) and epochs shows better results, but with the increase in the size of dataset the time consumed for training will be high, time constraint should also be taken care when choosing the number of layers.

To increase the number of subscribers, one must be in touch with the followers, our model enables the youtuber to predict the label which can help to understand the user's requirement. In order to improve our exploration and give the different cookery channels on YouTube to construct their supporters base, we are intended to develop model with the Rest API to make the process automated. Building the Rest API is the future enhancement of our present investigation.

VI. CONCLUSION AND FUTURE WORK

Commitment and engaging with users is an immense trendy expression in the internet based life space. Social media brands are regularly entrusted with showing their commitment with their users on every social network they are dynamic on, yet frequently comments on a YouTube channel are left unanswered. It's similarly as essential to react to the comments of YouTube on your channel for what it's worth to react to a wall post on your Facebook Page. Here we chose cookery channels based on Indian cuisines as most of the Indians are living abroad and migrating to nearest cities. Therefore, our research is on doing sentiment analysis on the YouTube cookery channels. Since we found already a study has been done on this topic, in that they used machine learning algorithms we used these models as baseline and applied multi-layer perceptron model with different combinations of parameters. We got an accuracy of 98.53% on Kabita's dataset and 98.48% on Nisha Madhulika's dataset by multi-layer perceptron with the count vectorizer. By this it can be concluded that multi-layer perceptron with count vectorizer provides better results than the baseline models.

For future, we are planning to create a pre-trained Hinglish embedding and increase the size of the dataset by adding recent comments by doing this we can get better results for models with embeddings. We additionally intending to apply advanced deep learning models and perform correlations by which we discover better model to develop Rest API, which would push Youtubers to consequently isolate the users' remarks and help them to comprehend the necessities of the users [10].

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A Review on Automatic Handwritten Devnagari Text Generation in Different Styles Using Recurrent Neural Network (Deep Learning) Especially For Marathi Script

[1] Mr.Vajid Khan, [2] Dr.Yogesh Kumar Sharma.
[1] Research Scholar, [2] Professor, [2] Research Coordinator JJTU Rajasthan.
[1][2] Deparment of Computer science and engineering,
[1] Research Scholar, Shri JJTU, Rajasthan, [2] Professor, Shri JJTU, Rajasthan

***Abstract:*-- The point of manually written numeral acknowledgment (HNR) framework is to arrange input numeral all in all of K classes. There are two standard HNR frameworks have 2 parts: include examination and example order. In Feature investigation step, information applicable for example classifier. The example order step names the numeral all things considered of K classes exploitation the classification models. Throughout the years, right keen amount of work has been distributed inside the space of HNR. Differed ways are arranged inside the writing for characterization of composed numerals. These grasp Hough changes, structured presentation ways, head part examination, and bolster vector machines, closest neighbor strategies, neural processing and fluffy basically based methodologies.**

Keyword: Handwriting recognition, CNN-RNN network, Data augmentation, Image pre-processing.

I. INTRODUCTION

The aim of handwritten numeral recognition (HNR) system is to classify input numeral put together of K classes. There square measure 2 normal HNR systems have a pair of components: feature analysis and pattern classification. In Feature analysis step, data relevant for pattern classifier. The pattern classification step labels the numeral put together of K classes mistreatment the class models. Over the years, right good amount of labor has been assigned at intervals the area of HNR. Varied ways that square measure planned at intervals the literature for classification of written numerals. These embrace Hough transformations, bar chart ways that, principal half analysis, and support vector machines, nearest neighbor techniques, neural computing and fuzzy based totally approaches. An intensive survey of recognition performance for giant written info through several forms of options and classifiers is reportable. as compared with HNR systems of varied non-Indian scripts [e.g. Roman, Arabic, and Chinese] we discover that the popularity of written numerals for Indian scripts continues to be a difficult task and there's spurt for work to be exhausted this space. a quick review of labor exhausted recognition of written numerals written in Devanagari script is given below .Devanagari script, originally developed to jot down Sanskritic language, has descended from the Brahmi script someday round the eleventh century AD. It's tailored to jot down several Indo-Aryan languages like Sanskritic language, Mundari, Nepali, Konkani, Hindi and Sanskritic language itself. Sanskritic language is associate degree Indo-Aryan language spoken by regarding seventy one million individuals in the main within the Indian state of Maharashtra and close states. Sanskritic language is additionally spoken in Israel and Mauritius. Sanskritic language is assumed to be a descendent of Maharashtra, one in all the Prakrit languages, which developed from Sanskritic language. Since 1950 Sanskritic language has been written with the Devanagari alphabet.

To the simplest of our information customary dataset for Sanskritic language numeral isn't obtainable until nowadays. Therefore, dataset of Sanskritic language written numerals zero to nine is formed by assembling the written documents from writers. Knowledge assortment is finished on a sheet specially designed for knowledge assortment. Writers from totally different professions were chosen together with students, clerks, teachers, and vendors and were asked to jot down the numerals. No constraints were obligatory on the utilization of ink or pen except that they need to jot down the numerals within the boxes of the sheets provided to them.

A well-defined feature extraction algorithmic rule makes the classification method more practical and economical. 2 well-defined ways of feature extraction employed in our methodology are Fourier descriptors and normalized chain codes. Feature extraction stage in character recognition, as in any pattern recognition task, plays a significant role in raising the popularity accuracy. The options are extracted from binary characters. Thus, the characteristics used for classification lie alone within the form variations. The several characters are similar in form or slight variation within the genre could result into misclassification. The options hand-picked ought to tackle of these issues. Moreover, one feature extraction and classification stage could acknowledge a personality which cannot be recognized by the opposite feature extractor and classifier combination. Thus a hybrid system is required which will acknowledge the characters over a large vary of variable conditions. The cropped characters in every structural category are resized to a hard and fast size before extracting the options. 3 totally different options are extracted to be applied to a few separate neural networks. The options extracted are picture element density options, Euclidian distance options and changed approximation wave options. The options extraction procedure is explained next.

II. LITURATURE SURVEY

Recognition of Marathi Handwritten Numerals by Using Support Vector Machine in this paper by Ms. Pratibha V. Waje we have a tendency to gift a technique for automatic recognition of Marathi written numerals. The aim of written numeral recognition (HNR) system is to classify input numeral jointly of K categories. Handwritten numeral recognition system have 2 part feature analysis & pattern classification The feature extraction is by exploitation the chain code and Fourier Descriptor we have a tendency to verify the form of numerals . After preprocessing the numeral image, the normalized chain code and also the Fourier descriptors of the contour of the numeral area unit extracted. These options area unit then fed within the Support Vector Machine (SVM) for classification. The proposed technique is experimented on information of 12690 samples of Marathi written numeral exploitation quintuple cross validation technique. We've obtained recognition accuracy of 95.12%.

The according that AN economical methodology for recognition of isolated Marathi numerals has been conferred with stress on feature extraction methodology. Density supported division approach, and central moments area unit used as options to facilitate recognition method. Experiments area unit disbursed on a info size of 12690 numeral pictures victimization multiple cross validation methodology. The projected system is freelance of variability concerned within the literary genre of various people and is dilution free. Recognition rate obtained with Support Vector Machine (SVM) classifier (97.89%) is best compared with minimum distance classifier (96.31 %) and k-Nearest Neighbor (k-NN) classifier (96.55%)

In this paper we have a tendency to gift an outline of Feature Extraction techniques for off-line recognition of isolated Gurumukhi characters recognition. Choice of Feature Extraction methodology is perhaps the one most significant think about achieving high performance in pattern recognition. Our paper presents Zone based mostly approach that is that the combination of image center of mass zone and zone center of mass zone of numeral/character image. In image center of mass zone character is split into n equal zone so image center of mass and therefore the average distance from character center of mass to every zones/grid/boxes gift in image is calculated. Similarly, in zone center of mass zone character image is split into n equal zones and center of mass of every zones/boxes/grid and average distance from zone center of mass to every constituent gift in block/zone/grid is calculated. We've got used SVM and K-NN for later classifier and recognition purpose. We have a tendency to obtained ninety five.11% and 90.64% recognition accuracy SVM and K-NN severally.

Malika Ait Aider et.al. Kamal Hammouche et.al., Djamel Gaceb et.al. (2018) rumored that technique of written character recognition which mixes a moving ridge rework and one support vector machine classifier. The moving ridge rework permits United States characterizing the character pictures by a collection of options. The connexion of those options depends powerfully on the selection of the kind of the moving ridge and sub-images derived from the moving ridge rework. during this paper, many tests together with many moving ridges and swish and details sub-images derived from the wavelets square measure conducted so as to see the most effective wavelet and therefore the best sub-image within the written recognition framework. Experimental results on MNIST information reveal that sym8 moving ridge outperforms alternative styles of wavelets as those employed in the previous works. They show conjointly that options extracted from the sleek sub-image allowed achieving the most effective recognition rate. The projected technique is economical compared with alternative written recognition strategies printed within the literature. As future work, we tend to

intend on one hand to integrate a standardization operation as pre-processing procedure so as to control the position and form of character pictures, thus on scale back form variation between the pictures of same category. On alternative hand, to analyze alternative options extracted from the four sub-images.

Teena Mittal and Rajendra Kumar Sharma (2015) reported that speaker-dependent, isolated word recognition system for Hindi numerals has been enforced. Options of speech in terms of LPC, MFCC and combination of LPC and MFCC area unit thought-about to acknowledge Hindi numerals. The SVM classification is performed in 2 steps. Initially, a one-versus-all SVM classifier is employed to spot the Hindi language then ten one-versus-all classifiers area unit accustomed acknowledge Hindi numerals. The experiments are applied in 2 phases. In initial part, the quantity of frames has been fastened and totally different folds in k-fold cross validation are applied for coaching and testing of SVM. To explore the most effective kernel strategy, linear, polynomial and RBF kernels are used for the development of SVM. The very best recognition rate of ninety four.0% has been achieved exploitation linear kernel strategy with combination of LPC and MFCC options and 10-fold cross validation. The linear kernel strategy systematically dominated alternative kernel methods during this part of experiment. The linear kernel has advantage as compared to alternative kernels is that it doesn't need any kernel parameter to line. Within the second part of experimentation, the quantity of frames has been varied to calculate the popularity rate exploitation SVM with linear kernel. The very best recognition rate of ninety six.8% may be achieved with combination of LPC and MFCC options, whereas using 10-fold cross validation and twenty six frames.

2.1 Need of work:

To achieve better results in forensic applications: The current application domain of the framework is used in crime investigation and prosecution. We expect a huge potential for research and development in the field of forensic handwriting and signature analysis as well as writer identification.

Humanoid: This application is used to eliminate the human errors in handwriting. If we are using old papers which are not visible properly, we can use this technique.

Robotics: Humanoid robots have been used in several scientific areas as a research and development tools. In addition to research, humanoid robots have been developed to perform different human tasks like a human. They are reprogrammable repeatedly for fulfilling different tasks expected from them. With the advancements on technology, humanoid robots have been widely used on industrial applications due to their reducing costs. In this study, artificial neural network application have been implemented on images which taken from NAO's camera instantly. Segmentation and feature extraction methods have been used to find characters. NAO robot has been successful to find and say characters on images after training robot with training dataset. The results show that, using neural network algorithms gives good results on character recognition applications.

III. METHODOLOGY

For any character acknowledgment framework, there are four noteworthy stages in particular Segmentation, Processing, Feature extraction, Classification and Recognition.

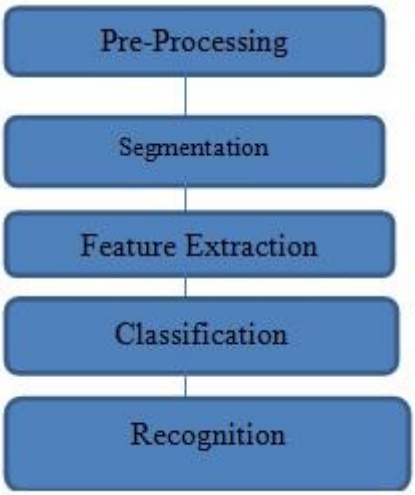

Fig.1 Character Recognition System

Step 1: Character Recognition System: we use Ant Miner Algorithm.

Step 2: Feature Extraction: To extract the feature vectors from the normalized images, a sliding window approach is used. The seven features are the following:

1. The mean gray value of pixels
2. The center of gravity of the pixels
3. The second-order vertical moment of the center of gravity
4. The positions of the uppermost and lowermost block of the pixels
5. The rate of change of these positions
6. The number of black-white transitions between the uppermost and lowermost pixels

7. The proportion of black pixels between the uppermost and lowermost pixels

Step 3: Recurrent Neural Network:

A Recurrent Neural Network (RNN) is connections of model containing a self-connected hidden layer. RNNs provide a very elegant way of dealing with sequential data that embodies correlations between data points that are close in the sequence .RNN has the ability to make use of previous context.

IV. CONCLUSION

The deep learning based mostly models have centred on recent architectures and therefore the convenience of enormous scale annotated knowledge. During this work, we have a tendency to explore these 2 factors systematically for up written recognition for scanned off-line document pictures. We have a tendency to propose a changed CNN-RNN hybrid design with a significant specialize in effective coaching using: 1. Economical format of network mistreatment artificial knowledge for pertaining, 2. image standardisation for slant correction and 3.Domain specific knowledge transformation and distortion for learning important invariances. We have a tendency to perform a close ablation study to analyse the contribution of individual modules and gift state of art results for the task of at liberty line and word recognition on well-liked datasets like IAM, RIMES and GW.

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A Review on E Learning Model Using Adaptive Classification Approach

[1] Mr. Pujari Vinayak , [2] Dr. R.B. Patil
[1] Research Scholar, [2] Professor.
[1][2] Department of Computer science and engineering,
[1] Research Scholar, Shri JJTU, Rajasthan, [2] S.K.Somaiya College of Arts, Science and Commerce, Mumbai, Maharashtra, India

Abstract:-- **Due to the emergence of knowledge and communication technologies in varied fields, that have additionally affected the tutorial sector, accommodative e-learning systems are recognized mutually of the foremost attention-grabbing analysis areas in distance web-based education. This analysis direction allows developers to build a model of goals, preferences and information of every individual user so as to adapt the educational to his/her wants and characteristics. The target of this paper is to gift the state of the art in accommodative e-learning systems as another to the traditional learning by describing its dimensions, design, architecture and theoretical approaches. We have a tendency to additionally highlight some prospects for our future work by finding out, analyzing and criticizing existing systems.**

Keyword: Adaptive learning, e-learning, context parameters, learner characteristics, intelligent tutoring systems, adaptive hypermedia systems.

I. INTRODUCTION

E- Learning is one amongst the analysis areas that have attracted the attention of the many researchers over the past few decades. In spite of its complexness, many works have raised attention-grabbing problems, particularly the difficulty of learning resources accessibility to ensure "learning for all". in line with [1], learning challenge isn't solely to create resources accessible to everyone, anywhere, at any time and in several formats, but also to supply the training within the place, time and acceptable manner. As a result, researches have given additional importance to distance education, and specially to e-learning so as to improve learners' performance and reach their satisfaction [2].

In this perspective, the contextualization of learning could be a new paradigm for adaptive systems so as to remedy the traditional learning limits [3] that is not any longer able to offer interactivity, time period execution, self-control, personalization of academic content, adaptive format of presentation and learning navigation. Adaptive systems aim to adapt the learning's ancient approach so as to satisfy the learners' needs [4].

The main objective of this paper is to study the concept of adaptive learning, to define its dimensions and to analyze the systems developed since 2010. To achieve this objective, we must ask the following questions: What is an adaptive learning system? What is the architecture on which any adaptive e-Learning system is based? What are the approaches that we can use to implement these models and architectures? And finally, what are the typical solutions for each approach?

In response to these questions, this article is structured as follows: The first section draws on the concept and the definition of adaptive e-learning systems. The second section presents the architecture and the main components of these to model the adaptive learning as well as the typical systems of each approach. The last part deals with the related works as well as some comments about our future developments

II. ADAPTIVE LEARNING SYSTEMS

1. Electronic learning (e-learning)

The majority of researches define learning by the increase of knowledge in a quantitative way, memorizing information, acquiring skills and methods that can be used when necessary, interpreting and understanding reality in a different way [5][6]. In 1984, the author in [7] defined learning as a process whereby knowledge is created through the transformation of experience. This process is defined as a four-stage cycle that represents the way of perceiving, thinking, feeling, and acting which appears when we face new experiences. The four stages include being involved in a new experience, developing observations, creating theories to explain the observations, to solve problems and take decisions. According to [8], e-learning is another way to teach and learn. In [9], the author states that e-learning is based on three basic criteria. First, e-learning is networked and

that gives the ability to real-time upgrading, storing and retrieving, distributing and sharing information. Second, it's delivered to the user via his/her device using internet technology. Third, it focuses on the largest view of learning that exceeds the traditional paradigms of education

2. Adaptive e-learning system

Research in reconciling systems is often copied back to the early Nineties. At that point, the 2 major areas of machine-readable text and user modeling created made analysis concepts as results of the degree of improvement they reached. an outsized variety of research groups recognized static machine-readable text issues in different application domains and had began to review numerous ways to adapt the behavior of machine-readable text systems to users in Associate in Nursing individual manner [10]. Currently, research within the field of e-learning is oriented toward learning platforms wherever learner's expectations, motivation, learning designs, habits and desires are increasingly taken into thought [11]. These factors highlight the concept of reconciling learning systems [12] as Associate in Nursing alternative to the standard approach «one-size-fits-all» within the development of teaching materials. The authors in [13] outline adaptation because the ability of a system to change its behavior in keeping with the learner's wants and alternative characteristics

The main components of each adaptive system are described as follows:

3. Source of adaptive learning

According to [14], the source of adaptation (learner, environment or device) is related to the objectives of each system as well as the desired result. If the goal is the learner, we give more importance to his characteristics. Relevant ones are encapsulated in the learner model which is an essential component for each e-learning system to be adaptive [15]. Learner's characteristics have been the subject of various researches in adaptive e-learning systems and education areas. The choice of characteristics depends on the system. According to [14], in the case of a static system, the mechanism of adaptation is a traditional one using the characteristics predefined by the learner during his/her first use of the system, including personal information, learning style, goals and preferences. It's made before the learning process begins. However, dynamic adaptation requires a process of interaction between the user and the system. In that case, the use of dynamic characteristics updated in real-time is required. Example: skills, emotions, level of knowledge, history, navigation and test results [16] [17]. The author in [18] states that the difference between these characteristics appears in the duration. Static characteristics are used on a long-term basis because they represent general information, while dynamic characteristics are used on a short-term basis because they are changeable, specific and interactive. In some research works, and for more efficiency and integrity, learner characteristics are combined with context parameters. For example: location, detected noise, connectivity, hardware used and user's movements [17].

4. Target of adaptive learning

The authors in [17], [19] and [20] state that the foremost wide applied adaptation target is that the learning material itself (learning content). During this case, courses area unit conferred in an exceedingly completely different means to each learner. The degree of problem of education supports is additionally taken into thought according, for example, to the learner's information level. different studies have asserted that related supports are often tailored to every learner by adapting suggested links also as further pedagogical materials whereas mistreatment the system [17] [21] [22]. In other works, the training format (content presentation) is often a tailored text or a multimedia system content (image, video, audio, animation). The program can even be tailored to the learner preferences [17] [23] [24] [25]. Additionally, the training navigation are often tailored by identifying between world navigation (redirection to external sources) and native navigation (using constant system) [14] [25]. The work presented in [17] indicates that cooperative learning can even be a form of adaptation by making teams of learners with common characteristics so as to assign every new learner to the appropriate cluster.

III. ADAPTIVE E-LEARNING MODELS

1. Macro-Adaptive Approach

According to [32], this approach assumes that the method of adaptation exists to permit learners to maneuver from a course to another with AN tailored rate. this is often as a result of learners take issue from one another in their learning capacities. Other characteristics are taken into thought, such as objectives, preferences, level of data, intellectual abilities, learning designs, psychological feature designs, academic motivations, temperament, experiences and achievements [33] [34]. The general model of this approach is predicated on a regular sequence initiated by the teacher. as an example, explaining or presenting specific info, giving examples, asking questions, and so providing feedback to learners' queries. This recurrent sequence within the teaching method by reciting and presenting the course in an

instructional means and exploitation static methods, is that the disadvantage of this approach [35].

2. Aptitude-Treatment Interaction (ATI) Approach

This approach is predicated on the speculation mentioned in [36]. The goal of the ATI approach is to spot the most learners' aptitudes through analyzing and understanding his/her behavior. It additionally suggests changing treatments to maximize the system's interaction with learners' talents, to facilitate their life in learning things and to extend their satisfaction. According to [31], one in every of the foremost necessary aspects of the ATI approach is that the user's management over the training method. The author has mentioned that many studies have additionally suggested that the self-control's success depends on the learner abilities. It's higher to limit the management (total or partial) for students with low-prior information and/or to boost learning for students United Nations agency have high performance. During this context, the work bestowed in [37] defines 3 levels of control: complete independence, partial management among a given task state of affairs and fixed tasks with the management of pace. Intelligent Tutoring Systems (ITS) ar supported the ATI approach over the detection of users' skills. The implementation of ITSs is predicated on the design of adaptive e-learning systems, that contains the learner model and also the domain model. Besides, ITSs use the difference model to generate and to gift tailored materials to every learner [38]. Adaptive interactive multimedia system systems are AN example of this approach. The goal is to style learning solutions that integrate interactive multimedia system content in ITSs so as to adapt it to each learner's profile [31].

3. Micro-Adaptive Approach

This approach permits to diagnose the precise learners' needs so as to supply them with the foremost applicable learning method [34]. Not like the macro-adaptive approach, this approach is dynamic because of the utilization of quantitative, temporal and time period learner's characteristics. this is often doable by analyzing and observation the learner's reactions and behavior over the system so as to adapt the education style of the learning method [33]. This approach includes numerous characteristics over the macro-adaptive approach, including motivation, learner errors, emotional standing and others [35] . According to [34], this approach is predicated on two main processes:

A. Diagnostic process:

Its detects the learners characteristics (aptitudes, abilities, motivation, knowledge, preferences, learning vogue.

Improvement process:

Its optimizes the learner's interaction with the system whereas adapting the training content and sequence.

In [35], the author mentions that ITS and adaptive hypermedia systems are relevant samples of this approach. They use the micro-adaptive approach within the diagnostic method in order to extract the learner's characteristics. This method begins with the gathering of context information, analyzes and compares them with the predefined ones to assign every new user to the acceptable class. Finally, it generates the adaptation method by adapting content, format or navigation.

IV. CONCLUSION

In this paper, we have presented the mechanism of adaptive e-learning systems supported the idea of contextualization. We have highlighted the most elements of accommodative e-learning systems depicted within the supply, target and adaptation path. We've got additionally mentioned the design of these systems composed of 3 main models (learner, domain, adaptation). Adaptation approaches were additionally presented by particularization the various theories and existing implementations. Finally, we've got mentioned an outline of the contributions created during this analysis space throughout the 2010- 2017 amount. We can conclude that the event of data and communication technologies, and specifically net and web technologies have a good impact on the tutorial sector, creating accommodative e-learning doable and necessary. However, the massive range of obtainable resources makes learners lost. Within the majority of cases, they become demotivated since their initial use of the system. What is more, learner's area unit most of the time in quality that slows their learning method down once they use associate e-learning system? In this context, the authors in [14] state that the challenge of accommodative e-learning developers is to seek out the learner characteristics that area unit crucial for an efficient learning and to show the influence of those characteristics on the method and the learning performance. Currently, there area unit many ways and techniques to model the learner. The selection of ways depends on the solution's objective and also the desired result as well because the effectiveness of the technique.

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