



A Survey on Service Oriented Architecture on Big Data, Cloud Computing and IOT

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Abstract: As the number of patients treated in-home are increasing exponentially mainly in countries such as Japan, US A and Europe etc., these people often enter into a critical situation that may require help immediately (e.g. when facing an accident, or becoming depressed). Researches and Advances in computing areas and the Internet of Things (IOT) have provided efficient and cheap equipments including wireless communication and cameras, such as smart phones or embedded devices that enable the deployment of Health S mart Homes (HS H) that can provide medical treatment of patients in their homes. The images captured from these cameras can help nurses or caretakers of patients to provide timely help. The use of such patient images and emotional detection to assist patients and elderly people within home is provided in this article. Internet of Things and Cloud computing can work together, which can address to the Big Data problems. Big data is actually a term used for a huge data set that performs operations like storage of data, analysis, sharing, transfer, predictive analysis; updating etc. data set can grow rapidly. Data sets have different analytics on data that involve process of inspecting, transformation and modeling of data so as to discover new information, and to reach on some particular decision. There are some particular data analysis techniques from which data mining is a popular one which focuses on modeling and discovery of new facts. The discovered knowledge helps in predictive analysis purposes as well as text analysis. Further on data mining is performed on data set which involves discovery of patterns by applying different operations at databases, and using artificial intelligence, machine learning, statics etc.

Keywords: Cloud computing, IOT, AI, face recognition, big data, data mining.

1. INTRODUCTION

Cloud computing has developed into a major trend in IT sector across world.[2] While industry has been pushing the Cloud research agenda at high pace, academic researches" are being done under this field has as it can be seen through the tremendous rise in workshops and conferences focusing on the area of Cloud Computing.

The Internet of Things (IOT) is a new technology of connecting "everything" that can hold minimum memory for storage and requires very less computational power, so that the connected things can communicate anytime, and anywhere across world By analyzing the basic concepts of IOT and Cloud Computing, we can integrate both the technologies .This Cloud-IOT model provides a number of applications and many platforms are already available for such a paradigm. However, there are some of limitations devices associated with The IOT in terms of storage, network, computing, scalability, etc. So some integration challenges are also faced due to these problems. Some green datacenters are also provided having air conditioning system assisted by cloud techniques, which is having two subsystems: a data center air conditioning system and a cloud management platform .The data center air conditioning system are including environment monitoring, air conditioning, ventilation and temperature control like facilities , whereas the cloud platform provides data storage and manipulation facilities. Big data is actually a term used for a huge data set that performs operations like storage of data, analysis, sharing, transfer, predictive analysis; updating etc. data set can grow rapidly. Data sets have

different analytics on data that involve process of inspecting, transformation and modeling of data so as to discover new information, and to reach on some particular decision. There are some particular data analysis techniques from which data mining is a popular one which focuses on modeling and discovery of new facts. The discovered knowledge helps in predictive analysis purposes as well as text analysis. Further on data mining is performed on data set which involves discovery of patterns by applying different operations at databases, and using artificial intelligence, machine learning, statics etc. AI and the field of machine learning in particular, is a very vast field. It's an exciting area with continuous research and developments.

2. LITERATURE REVIEW

By the definition of cloud, cloud is the developed from parallel computing, distributed and further from grid computing combining virtualization technologies in these strategies. This paper explored the cloud computing concept and related it with the old concept grid computing. Mladen A. Vouk et al. [1] focuses on different existing platforms of cloud and explained the characteristics and applications of them. Different issues of cloud computing are pinpointed. The issue of Cloud interoperability is also highlighted here that can be used for further research and development. This paper also discussed about different providers of cloud. According to this paper, cloud computing is becoming a great paradigm attracting many enterprises, either small or large, and it could affect different enterprises as it is changing IT sector significantly. Different research agenda were discussed in

cloud in many papers. Computing resources are delivered as a service by using the concept of cloud computing. Computing is given as a service to customers from huge data centers available or commonly known as clouds using internet. This paper is presenting a review on peer reviewed research on academics and is provides an overview on different technical foundations and their research area efforts. Ilango Sriram_et al. [2] discussed related technologies, advancements in protocols used, different interfaces and standards, different modeling techniques used in cloud .Models of clouds are discussed in detail. Research agenda is also presented and the review showed that community dealing with research of cloud technologies can learn from related communities. Attempts are being made to develop API for accessing clouds which is a challenge in both ways either technically or politically. Different use cases were used to present the cloud. This paper also reviewed several technical aspects in cloud computing. In together it presented a complete survey of all the researches done on cloud. Cloud computing provides a service oriented architecture with a great flexibility with lower cost having a reduced information technology overhead for the end user. Santosh Kumar_et al [3] discussed various issues of cloud and different research areas with their implementations. The author says that the next step in evolution of technologies that provide online and on demand services is cloud which is further based on virtualization of resources. The term cloud became popular when IBM and Google announced collaboration in this domain. IBM announced “BLUE CLOUD” which made cloud popular in IT sector.

Different components are discussed here in this paper like reusability, extensibility, scalability, etc. Somayya Madakam_et al. [4] has discussed that Internet of things will transform real world objects into virtual objects that are intelligent. It is aiming to unite everything existing in world using a common infrastructure so that we can control the things around us and also be informed of states of things around us. Many researchers are moving towards this technology and focusing on its definitions, requirements and various characteristics of IOT. This paper provides an overview of this technology, its architecture and its usages in our routine life. [5] IOT is making a great change in our lives, which will make our routine lives more comfortable. IOT is used in almost all do mains like transportations, manufacturing areas, medical and health care, education, governance etc. There also exist some flaws in IOT at its implementation level and in legal areas. There is no as such proper definition of IOT. Proper standardizations are required in various levels and proper interoperability is required. There exists a significant overlaps in areas like sensing, actuation, communications. Researchers are moving forward to provide cooperation between these communities. A smart world like notations has changed the world of technology. John A. Stankovic_et al. [5] is discussing to raise awareness on how the work is being performed across various research communities and is discussing on various characteristics of IOT like robustness, openness, privacy and IOT architectures and its collaboration with big data. More new problems are arising in technology areas due to huge amount devices existing, and their

collaboration, and as privacy and security are concerned. There should be huge cooperation between areas of research so as to solve such kind of problems.

Avneet Pannu_et al.[6] discussed that artificial intelligence is the intelligence of machine. This field is enhancing routine lives of humans and has improved the performance in technology.AI is affecting various fields like science, engineering, medicine, business etc. There is huge increase in quality as well as efficiency. This paper has discussed various areas under AI. The current usage of AI in PSS design is that it is used to damp out the oscillations of power system which is caused by interruptions. Secondly it can be used in medical domain for classifications of medical image and in gaming also. Nicholas L. Cassimatis_et al. [7] showed AI is actually giving the machine ability to think using concepts. A lot of inventions are made in this area from last few decades. This paper is also discussing that how a network is protected from intruders and many more. Still researchers and scientists are working under this area to analyze its full potential. A cognitive system is created using artificial intelligence. This is different from normal scientific objectives as modern technology is used in cognitive systems. Any system has human level intelligence if it is able to perform the tasks same likely as humans. In this paper, definition of cognitive is defined. AI uses various different methods of normal sciences. The notion of a cognitive substrate motivates a different set of standards for research towards HLA. AI includes “quasi-formal” research into linguistic semantics, huge reductions between reasoning problems in differing domains are present, the development of microcosms for evaluating research, and constructing systems that integrate multiple abilities are present.AI has extraordinary goals and the benefits.

Omkar Pimple_et al. [8] proposed a system with multiple mobile agents, which have a shared intelligence. Such architecture will enable the entire system to become „smarter“ as each individual agent has new experiences and learns about new things. Whenever each node learns something new, it makes its peers learn, thus greatly exceeding the rate of learning of the entire system. Extraction of the color, shape and size of an image is done. An attempt is made to identify the object in the image using its local intelligence. Further, it tries to learn about the object from its peers. If none of its peers knows about the object, it simply learns about the object from the user, and updates its own knowledgebase present in database. When a similar object is encountered at a later stage, the system is able to recognize the object based on its own knowledge, or from its peers“ knowledge, this is in the same way as humans learn. Through negotiation, agents make joint decisions, involving allocation of resources, adoption of policies, or any issue of mutual concern, which makes a reliable decision. The proposed project creates a system with multiple agents, which are a part of a distributed artificial intelligence. Proper training to identify a set of objects based on visual aspects attributes, like color, shape and size is done in the system

The detection algorithm used in this paper uses a simple relation between the area of the object and the area bounded by the borders of the object.

Including extra attributes like the absolute dimensions of the object, length, breadth and radius would require multiple viewpoints which will help to eliminate inaccuracies like parallax errors.

Sandeep Kumar *et al*. [9] presented a new perspective of Artificial Intelligence (AI) is presented in this paper. It is

adding the concept of two well known Artificial Intelligence techniques Neural Computing and Genetic Computing. The paper gives an idea of the facts which are supposed to match the intelligence and behavior of a human being and also discusses some of natural phenomenon and how they can be confirmed by the definition of AI. The paper is not claiming that there exist some faults in defining AI. It just augments the existing definition by some other features that can make it more close to naturally occurring intelligence. The features augmented are naturally inspired in the same way as AI, Neural Network and genetics all are naturally inspired.

TABLE 1. Research Challenges of Cloud Computing, Big Data IOT

S.NO.	Authors	Title	Classes	Classifiers	Strength
[1]	Mladen A. Vouk	Cloud Computing – Issues, Research and Implementations	Cloud computing issues	Infrastructure, Components, Virtualization, VCL technology.	Cloud implementation based on VCL technology is discussed.
[2]	Ilango Sriram, Ali Khajeh-Hosseini	Research Agenda in Cloud Technologies	Cloud computing	general introductions, technological aspects of cloud and organizational aspects	Definitions of cloud, socio-technical aspects of cloud, technological aspects
[4]	Somayya Madakam, R. Ramaswamy, Siddharth Tripathi	Internet of things(IOT)- A Literature review	Cloud computing, IOT	IOT, definitions, Requirements, Architectures.	IOT applications, its benefits
[5]	John A. Stankovic,	Research Directions for the Internet of Things	Mobile computing, IOT, wireless sensor network	Vision and scope of IOT , researches in IOT	IOT becomes a utility.
[6]	Avneet Pannu	Artificial Intelligence and its Application in Different Areas	Artificial Intelligence, Intrusion Detection Systems, Neural Networks	Language understanding, Learning, problem solving, PSS	Areas of AI, techniques used in AI, used in PSS
[7]	Nicholas L. Cassimatis	Human-Level Artificial Intelligence Must Be an Extraordinary Science	Artificial intelligence, cognitive sciences	HLAI not a normal science, formal linguistics	HLAI concepts, quasi-formal research
[9]	Sandeep Kumar Medha Sharma	Convergence of Artificial Intelligence, Emotional Intelligence, Neural Network and Evolutionary Computing	Neural Computing, Intelligence, Emotions	Soft computing, Artificial Neural Network, Genetic Computing	Newly introduced concepts make artificial agent close to natural agents in terms of intelligence.
[10]	Vinay Bettadapura	Face Expression Recognition and Analysis: The State of the Art	Expression recognition, emotion classification, face detection, face tracking,	Facial Parameterization	the major challenge faced is the non-availability of spontaneous expression data
[12]	Ravi Tiwari	A Data Mining Model to Improve Placement	Data mining	predication, random tree	It helps in the development of the system
[13]	S. Syed Shajahaan, S.	Application of Data Mining Techniques to	Data mining	C4.5, Classification and Regression	random tree outperforms of all other

	Shanthi, V. ManoChitra	Model Breast Cancer Data		(CART),Random Tree	algorithms with highest accuracy rate
[14]	Jyotismita Talukdar	Detection of Breast Cancer using Data Mining Tool (WEKA)	Big data , data mining	Clustering ,Association Rule Discovery ,regression	Can be used for early detection

The table above describes various papers reviewed where classes describes area the paper is working on, classifiers describes their technologies and strength concludes the table.

Vinay Bettadapura _et al.[10] described the applications of automatic face expression recognizers, the characteristics of an ideal system, the databases that have been used and the advances made in terms of their standardization and a detailed summary of the state of heart. Face tracking models are discussed.

This paper introduced the recent advances in face expression recognition and the associated areas providing background knowledge on this particular area. The focus is definitely shifted from posed expression recognition to spontaneous expression recognition.

Pankajdeep kaur_et al.[11] has described the use of cloud computing in creation and management of cloud in the area of health care services. CBIHCS (cloud based health care service) is introduced, which is performing real time monitoring. This monitoring involves diagnosis of chronic disease. Different mechanism is proposed for providing resource elasticity for CBIHCS.

Ravi Tiwari_et al.[12] is dealing with application of neural network in the educational systems data, which can be further used for placements. Education data is used as a input and used to predict student's status regarding placement. The best field according to the nature of student data, that whether students have chances to get placed or not is also predicted.

S. Syed Shajahaan_et al. [13] explored capability of decision trees used in data mining tool to predict the presence of breast cancer. The performances of various conventional learning algorithms like random tree, ID3, CART, C4.5 and Naïve Bayes are also discussed. Out of all these random tree is accurate one.

Jyotismita talukdar_et al. [14] the essential step that is widely used in discovery of knowledge in databases is data mining. Here intelligent methods are used to extract and define new patterns from the given Meta data. Breast cancer data is used here to extract new information. This extracted information can further be used to reduce deaths caused by breast cancer. Experiments are done on data sets by using tool WEKA data mining tool.

CONCLUSION

The use of images and emotions can be done for providing the healthcare in smart ho me in an automatic way using an IOT infrastructure. Images can be used to identify each person to ensure that the right person is being tracked in the house and

what kind of treatment is required. The images can be to perform emotional recognition person using IOT technology as emotions play a crucial role to identify state of a patient. Emotion recognition system can be measured from different facial angles, gestures and postures for better results.

The circumplex model is a model describing different emotions that a person is having. Valence and arousal describes all affective emotional states, and there exists a layered representation of various cognitive processes that are interpreting various emotional experiences of a person.

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