



A Review Paper on Knowledge Based System on Telemedicine

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Abstract-As we are very much aware about the healthcare and medical system going traditionally from years. In this way, our country has failed to provide good healthcare, medicines, therapies, diagnosis and all other health related services. Due to lack of services, over population, illiteracy, dream of under-developed to developed nation has become a fear, like whether it will be fulfilled someday or not. Besides all these serious problems, India is majorly populated with under-developed remote areas, having improper health care system and lack of medicinal advantages. Also with the advancement in technology, these are areas and people residing in these areas are not in reach with the services. Keeping all these issues in mind, we came to the point, that these are inter-related with some factors like economic condition, awareness of various fields globally, healthcare, reach of technology to each and every part of country and citizens respectively. Therefore, we introduced with the concept of telemedicine in the scenario of India.

Keywords- *autism, medicine, multi-agent..*

1. INTRODUCTION

Telemedicine is a term of medical science, which is a collaboration of telecommunication and computer technology with medicines. It is mainly used for clinical consultation remotely. It is a tool, which is very valuable, provides crucially care services to areas which are backward. The vital role, it plays, is the use of electric signals to carry information and observation from one place to another. It is providing medical services in distant rural areas and communities. In this way, it is eliminating large distance barriers, improving and making health care system reachable to each and every corner and peak of nation. It is also making these services accessible to everyone. Various technologies are interconnected with it to make it more efficient and more useful for best results and proper health care of nation. It provides communication between patient and medical staff. It also provides platform for experts to learn and practice more. It is like a monitoring tool, helps in monitoring of patients residing in rural areas and therefore help in reducing their efforts of frequent visits which consumes lots of time and money. Here we are discussing about mental disorders about which people are totally unaware even in the 21st century, strange to hear but sadly true.

In this, we describe an example by taking a mental disorder called Autism, and problems faced by parents and victim of this disorder. Autism is such a mental disorder that it needs complete care. Individuals have problem in social development. Autism is a neuro-developmental disorder characterized by impaired social interaction, verbal and non-verbal communication, and restricted and repetitive behavior. Parents usually notice signs in the first two years of their child's life. These signs often develop gradually, though some children with autism reach their developmental milestones at a normal pace and then regress. The diagnostic criteria require that symptoms become apparent in early childhood, typically before age three. It is distinguished not by a single symptom, but by a characteristic triad of symptoms: impairments in social interaction; impairments in communication; and restricted interests and repetitive behavior.

They show very less stimuli to society, very less eye contact and they even rarely respond to their own name. Children with high-functioning autism suffer from more intense and frequent loneliness compared to non-autistic peers, despite the common belief that children with autism prefer to be alone. Making and maintaining friendships often proves to be difficult for those with autism. For them, the quality of friendships, not the number of friends, predicts how lonely they feel. Functional friendships, such as those resulting in invitations to parties, may affect the quality of life more deeply.

2. COMMUNICATION

Differences in communication, are likely to be found from the first year of life, and may include unusual gestures, diminished responsiveness, and vocal patterns that are not integrated with the caregiver. In the second and third years, children with autism do not have frequent word combinations; their gestures are less often synchronized with words. Children with autism mostly do not make requests or share experiences or are less interested, and but found with a symptom of repeating others' words or reverse pronouns. Some of the symptoms are :-

Repetitive Behavior

- **Stereotypy** is type of repetitive movement, such as head rolling, hand flapping or body rocking.

- **Compulsive Behavior** is a behavior intended and appears to follow rules strictly, such as arranging objects in lines or stacks.
- **Sameness** is a kind, which shows resistance to change; for example, insisting that the furniture should not be moved or refusing to be interrupted.
- **Ritualistic Behavior** involves an unvarying pattern of daily activities, such as an unchanging menu or a dressing ritual. This is closely associated or combined with sameness
- **Restricted Behavior** is involved with a defined limit in focus, interest, or activity, such as preoccupation with a single television program, toy or game and that also for so long.
- **Self-injury** includes the type of movements that injure the person, such as eye-poking, skin-picking, head-banging and hand-biting.

In the paper, on Quantifying Facial Expression-Related atypicality of Children with Autism Spectrum Disorder

Tanaya Guha¹, Zhaojun Yang¹, Anil Ramakrishna¹, Ruth B. Grossman²; 3Darren Hedley², Sungbok Lee¹, Shrikanth S. Narayanan Children with ASD are introduced with emotional face expressions perceiving and production. Adults often observe their expressions atypical. The paper is introduced with the new invention which has data driven ways to analyze and quantify in facial expressions of children with ASD. The sense of perceived a typicality induced by characteristics of facial gestures. A motion capture database MoCap is taken which compares facial expressions of children with and without ASD, employing six emotions categories Anger, Disgust, Fear, Happiness, Sadness and Surprise. Each emotion specific atypicality in facial expression of children with ASD into consideration and facial movements and dynamics. Overall complexity of mechanism which generate facial expressions. Information theory, statistics, time series modeling are the methods followed.

The paper, ***Developing Multi-Agent Systems With Jade***, by the authors, Fabio Bellifemine, Agostino Poggi, and Giovanni Rimassa, Bellifemine proposed the JADE which is software, which makes the development of multi-agent applications in consent with specifications of FIPA. Both abstraction and efficiency are put together by JADE design. The two important issues scalability and fault tolerance which are for distributed robust system infrastructure are mainly concerned by JADE. It has also supported very large Multi-Agent Systems as possible. It has further proposed many projects. Flexibility and Efficient Messaging are the two main concerns provided by communication architecture. JADE has an agent model and implementation in JAVA language which allows good runtime efficiency, software reuse, agent mobility and realization of different architecture.

The paper, A Hybrid Multi Agent System Architecture For Distributed Supervision Of Chronic Patients In The eHealth Setting by Olivier A. Blanson Henkemans, Stefano Bonacina, Nicola Cappiello, Charles A.P.G. van der Mast, Mark.

A. Neerincx, Francesco Pinciroli, Henkemans proposed a concept of eHealth, which is a collaboration of information and communication. Technology in health sector improves healthcare environment. For such an improvement, Cognitive Approach has been applied. In this, both design and implementation of architecture is used, incrementally, which are put on by easy data entry, management and verification by all important actors. In this paper, hybrid agent architecture is having multiple distributed agents and Virtual Personal Assistant for supervision of patients self care, with chronic illness and tested it in a laboratory setting and for this Cognitive Approach has proved best suitable technique so far.

An Agent-Based Knowledge Management Framework for Electronic Health Record Interoperability

By Fang Cao

This Research by Fang Cao, provided an innovation on eHealth applications. In this paper, a software agent has been proposed, which is based upon health information standards that allow interoperability among clinical systems which supports exchange of records among stakeholders in patients circle of case, easily. This agent based technical framework has provided new techniques for development of clinical decision support system , personal health record system development , these are the interoperability issues.

A Multi-Agent Intelligent Environment For Medical Knowledge

By Rosa M. Vicaria, Cecilia D. Flores, Andre´ M. Silvestrea, Louise J. Seixasb, Marcelo Ladeirac, Helder Coelho, In this thesis, Vicari , Rosa proposed AMPILA, a multiagent intelligent learning environment designed to support training of diagnostic reasoning and modeling of domains with complex and uncertain knowledge. Medical area is the focus point in this research paper. The approach is Bayesian Network, in which learner modeling tasks will consist of creating a Bayesian Network for a problem the system will present. It has two aspects, Qualitative and Quantitative, where qualitative part is concerned with network technology and the later one is composed of distribution conditional probability of the variables represented.

From the paper, A Multi-Agent Prototype System For Medical Diagnosis

by Qiao Yang and John S. Shieh, Department of Computer Science, Memorial University of Newfoundland. This paper, by Yang, Qiao is introduced with a model MADH (Multi Agent Diagnosis Helping System) in which knowledge based systems are considered as cooperative agents in diagnosis of medical care. The reasoning mechanisms of agents have been incorporated with two aspects, Fuzziness and Uncertainty. Java, Java Agent Development Framework, Java Expert Shell, NRC FuzzyJ Toolkit are the frameworks for the implementation. Proposed System has a big application in areas like automatic diagnosis, medical diagnosis and decision making systems. Fuzzy

Decision Tree combined with certainty factor calculation is meant to deal with fuzziness and uncertainty to deduce diagnosis results.

3. PROPOSED METHODOLOGY

By having review of above papers, I am trying to make a Knowledge Based System on Telemedicine. A GUI will be made in programming language Python. In this, database will be maintained of mental disorders having their symptoms, best suitable therapies, diagnostic tests, doctors, related organizations and appointments. Login id of patients and doctors will be made. This will help patients of mentally disabled children like autism, living in remote areas, to take first aid. So, it will help them to take the First Move i.e. and what steps to take further at the earliest possible way for their children in order to have their good social networking and easy and simple life going. It would be the best, if the move is taken as early as possible for both the child and parents. An algorithm will be discovered which check the relevancy about searching. How relevant and fast the searching will be if parents check through this system by entering the symptoms they find in their child. Parents/Guardians can get the clue or hint by diagnoses if any disorder a child may have and gives an alert to parents.

4. CONCLUSION

In above discussed literature, we studied different types of multi agent intelligent systems that are used by health care centers in a very flexible manner. Like MADH, AMPILA, JADE etc are used because they are highly adaptable and very easy going with changes come. For further research, we are trying to make a multi agent system for telemedicine and for diagnosis of mental

disorder . This will be mainly for people in remote areas who have very little knowledge.

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