PRELIMINARY SELF-DIAGNOSIS AND RECOMENDER SYSTEM

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BONAFIDE CERTIFICATE

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ABSTRACT

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To reduce the harm caused by improper self diagnosis and medication, an Artificial Intelligence system using different models is used. Comparing multiple methods help in improving the accuracy of the entire system by combining insights from various models. In addition to that, the user is directed to the right doctor to make diagnosis and recuperation, quicker and effective. The platform is aimed at being interactive and gamified to provide seamless experience to the user.

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INTRODUCTION

CHAPTER 1

INTRODUCTION

Disease diagnosis is the identification of an health issue, disease, disorder, or other condition that a person may have. Disease diagnoses could be sometimes very easy tasks, while others may be a bit trickier. There are large data sets available; however, there is a limitation of tools that can accurately determine the patterns and make predictions. The traditional methods which are used to diagnose a disease are manual and error-prone. Usage of Artificial Intelligence (AI) predictive techniques enables auto diagnosis and reduces detection errors compared to exclusive human expertise.
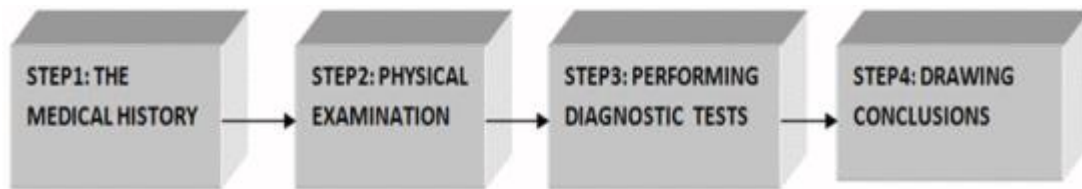
Diagnosis of diseases is the most challenging process at the same time, a very pivotal phenomenon for a medical care professional as before reaching the conclusion. The diagnostic process could be very tiresome and complex. To minimize the uncertainty in medical diagnosis health, the care experts collect empirical data to ascertain a patient's disease. The patient's correct treatment may be adjourned or missed with serious health issues due to making fault in the diagnosis process. Unfortunately, all doctors don't have expert knowledge in each domain of the medical field.

Hence, there was a need of automatic diagnostic system that provides benefits from both human knowledge and accuracy of the machine [7]. A suitable decision support system is needed to achieve accurate results from the diagnosis process with reduced costs. Classification of diseases depending upon various parameters is a complex task for human experts but AI would help to detect and handle such kinds of cases. Currently, various AI techniques have been used in the field of medicine to accurately diagnosis sicknesses. AI is an integral part of computer science by which computers become more intelligent. The vital need for any intelligent system is learning. There are various techniques in AI that are based on Learning like deep learning, machine learning, etc. Some specific AI methods that are significant in the medical field named as a Rule-based

intelligent system, provides a set of if-then rules in healthcare, which act as a decision support system.

The use of Artificial Intelligence, or AI, is growing rapidly in the medical field, especially in diagnostics and management of treatment. To date there has been a wide range of research into how AI can aid clinical decisions and enhance physicians' judgement.

Accurate diagnosis is a fundamental aspect of global healthcare systems. In the US, approximately 5% of outpatients receive an incorrect diagnosis, with errors being particularly common for serious medical conditions, and carrying the risk of serious patient harm.

In recent years, AI and machine learning have emerged as powerful tools for assisting diagnosis. This technology could revolutionise healthcare by providing more precise diagnoses.

Last year, scientists at Babylon, a global tech company focusing on digital health, found a new way to use machine learning to diagnose disease. They developed new AI symptom checkers which they believe could help reduce diagnostic mistakes in primary care.

The new approach overcomes the limitations of earlier versions by using causal reasoning in its machine learning. Previously, diagnoses were based solely on correlations between symptoms and the most likely cause.

Writing in Nature Communications, Dr Jonathan Richens and colleagues outlined their new approach, which includes the ability to "imagine" the possibility of a patient's symptoms being due to a range of different conditions.

Artificial intelligence (AI) has been deeply applied in the medical field and has shown broad application prospects. Pre-consultation system is an important supplement to the traditional face-to-face consultation. The combination of the AI and the pre-consultation system can help to raise the efficiency of the clinical work. AI has been focusing on the imaging diagnosis for a long time. For example, in the terms of iconography and pathology diagnosis, the diagnostic efficiency of the

AI even exceeds compared to the most experienced doctors, effectively improving the efficiency and accuracy of the medical staff. With the continuous development of the deep learning (DL) technology, the application scenarios of the AI continue to expand at the same time. Currently, AI has been able to diagnose common diseases, evaluate anesthesia, and manage pharmacies.

With the development of the medical technology, more and more diversified methods of observing diseases have made medical information more complex and the clinical decision-making also more cumbersome. To make a comprehensive decision, the doctors usually need to evaluate large amounts of the clinical information.

Dr Nanditha Mallesh said, "AI takes full advantage of the data and increases the speed and objectivity of diagnoses. The result of the AI evaluations is a suggested diagnosis that still needs to be verified by the physician."A research team in India, led by Dr Vathsala Patil of the Manipal Academy of Higher Education in Karnataka, looked at the potential of AI to improve the work of radiologists. In a recent journal article they write, "Evolution in hardware and software application has led to an escalating number of tasks performed by machines that were initially unimaginable. The most noteworthy tool has been the introduction of learning algorithms. Tasks can now be performed, which were previously limited to humans, thus indicating that these algorithms have significantly improved recently."

1.1.   GOOGLE TREND ANALYSIS

Artificial intelligence in healthcare market:
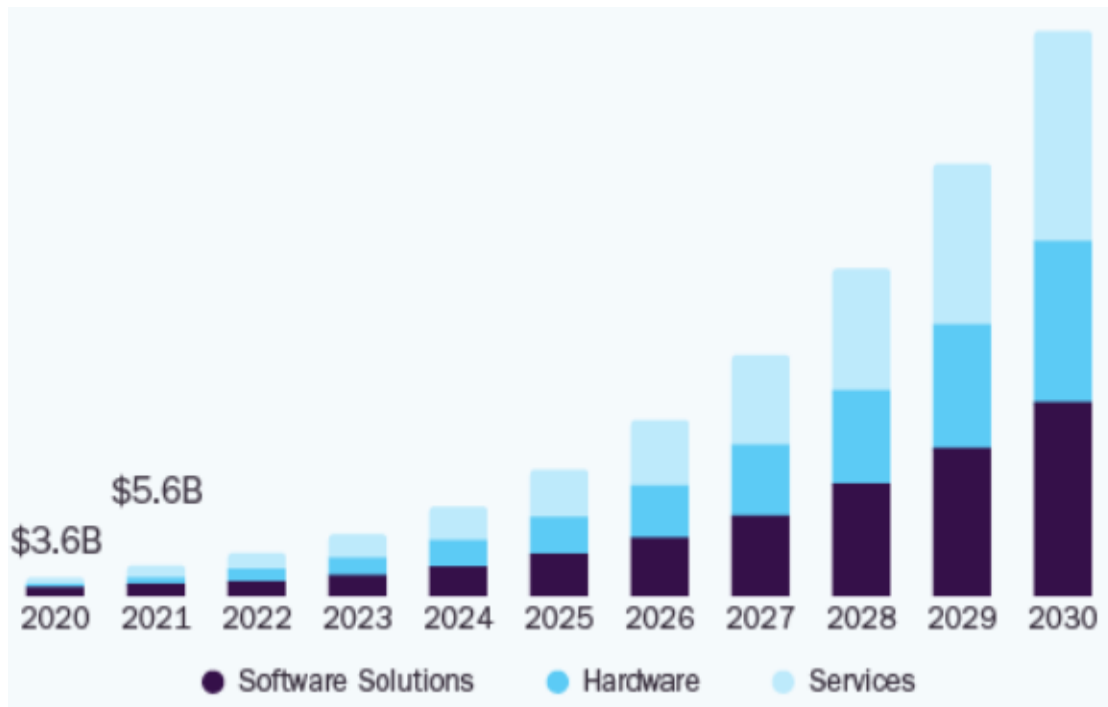
LITERATURE SURVEY

CHAPTER 2

LITERATURE SURVEY

2.1. INTRODUCTION

In recent times different techniques have been proposed by various people to overcome this problem. Some survey papers are given below.

2.2 LITERATURE PAPERS AND APPROACHES

(1) Medical Diagnostic Systems Using Artificial Intelligence (AI) Algorithms: Principles and Perspectives

-Simarjeet Kaur , Jimmy Singla , Lewis Nkenyereye , Sudan Jha , (Senior Member, Ieee), Deepak Prashar , (Member, Ieee), Gyanendra Prasad Joshi , Shaker El-Sappagh, Md. Saiful Islam , And S. M. Riazul Islam

This paper has reviewed the current literature for the last 10 years, from January 2009 to December 2019. The study considered eight most frequently used databases, in which a total of 105 articles were found. A detailed analysis of those articles was conducted in order to classify most used AI techniques for medical diagnostic systems. It further discusses various diseases along with corresponding techniques of AI, including Fuzzy Logic, Machine Learning, and Deep Learning.

This research paper reveals some important insights into current and previous different AI techniques in the medical field used in today's medical research, particularly in heart disease prediction, brain disease, prostate, liver disease, and kidney disease. Finally, the paper also provides some avenues for future research on AI-based diagnostics systems based on a set of open problems and challenges.

(2) Expert Systems in Medical Diagnosis

-K.I. Nkuma-Udah1 , G.O. Onwodi2 , D. Njoku3 and G.I.N. Ndubuka

This research sets out to review expert systems in medical diagnosis, ESMD. ESMD is usually designed to enable the clinicians to identify diseases and describe methods of treatment to be carried out taking into account the user capability. Many formats use the C Language Integrated Production System (CLIPS) as the tool for use to design the ESMD.

In this system, a number of patient cases is selected as prototypes and stored in a separate database. The knowledge is acquired from literature review and human experts of the specific domain and is used as a base for analysis, diagnosis and recommendation

(3) Comparing Fuzzy Logic Mamdani and Naïve Bayes for Dental Disease Detection

-Linda Perdana Wanti , Oman Somantri

This study compares the accuracy of the prediction results using the Mamdani fuzzy logic and the Naïve Bayes method in diagnosing dental diseases with initial symptom data. The purpose of this research is threefold. The first is to process data on dental disease symptoms and dental support tissues based on complaints of toothache consulted with experts at a community health centre (puskesmas). The second is to apply the Mamdani fuzzy logic and the Naïve Bayes to the proposed expert system. The third is to provide recommended decisions about dental diseases based on the symptom data inputted into the expert system.

This research provides recommendations for dental disease and dental support tissues using the Mamdani fuzzy logic method and the Naïve Bayes method. The results can be used for preventive healthcare treatments. The novelty of this research is to compare the Mamdani fuzzy logic and the Naïve Bayes against experts' judgment to measure the accuracy.

(4) Self-Diagnosis through AI-enabled Chatbot-based Symptom Checkers: User Experiences and Design Considerations

-Yue You, MS1 , Xinning Gui, PhD1 1 Pennsylvania State University, University Park, PA, USA

This study aims to explore the effectiveness of CSC apps and understand users' perceptions of them. By reviewing the functions of CSC apps, studying user reviews, and conducting user interviews, they have identified five features that consumer-facing diagnostic tools should provide for users when comparing with offline medical consultations: considering patient history in the diagnostic process, allowing users to input their symptoms at different levels, improving response speed of probing questions, providing support for diverse health conditions and user groups, and adding functions regarding follow-up treatments.

The study also sheds light on the conversational design of healthcare chatbots: healthcare chatbots should improve the input flexibility and the presentation of their probing questions. It argues these are directions that call for further research for the design of healthcare chatbots.This study has been taken as a inspiration in designing our questionnaire for our predictive system .

(5) An Empirical Study of Ensemble Techniques

-Rising O. Odegua

This paper presented a comprehensive empirical evaluation of Bagging, Boosting and Stacking ensembles. The results demonstrated that a Bagging ensemble nearly always outperforms a single classifier. The results also showed that Boosting ensemble on the average will outperform both Bagging and a single classifier.

Finally it was shown that Stacking ensemble nearly always outperform Boosting, Bagging and a single base classifier. However, for some data sets Boosting and Stacking may show zero gain or even a decrease in performance from a single classifier. Further research also indicated that Boosting may suffer from overfitting in the presence of noise which may explain some of the decrease in performance for Boosting.

SYSTEM SPECIFICATIONS

CHAPTER 3

SYSTEM SPECIFICATIONS

3.1. SOFTWARE

Operating system: Windows 10

IDE: Visual Studio

Coding Language: Python

3.2. HARDWARE

Processor: Intel core i5

Hard disk: 1TB

RAM: 8GB

SYSTEM ANALYSIS

CHAPTER 4
SYSTEM ANALYSIS

4.1. INTRODUCTION

4.2.   EXISTING SYTEM

4.3. CHALLENGES IN EXISTING SYSTEM

4.4. PROPOSED SOLUTION
4.4.1. OVERVIEW OF SYSTEM ARCHITECTURE
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4.5. SUMMARY

This chapter provides the overall system design and model architecture which facilitates better understanding.

SYSTEM IMPLEMENTATION

CHAPTER 5
SYSTEM IMPLEMENTATION

5.1. INTRODUCTION

5.1.1. TOOLS USED IN THE SYSTEM

5.2. MODULES

RESULTS AND DISCUSSIONS

CHAPTER 6

RESULTS AND DISCUSSIONS

CONCLUSION AND FUTURE WORK

CHAPTER 8
CONCLUSION AND FUTURE WORK

Recent advancements in AI techniques lead to successful applications of AI in healthcare. Even it has become a hot topic of discussion whether AI expert systems will eventually replace human doctors. Still, we consider the fact the AI expert system can assist the human doctor to make a better decision or even replace human judgment in some cases. Different AI techniques can help to find out relevant information from a large amount of clinical data. Also, AI methods are trained in such a way that can have the ability of self-learning, error-correcting, and they produce results with high accuracy.

REFERENCES

REFERENCES

1. [Medical Diagnostic Systems Using Artificial Intelligence (AI) Algorithms: Principles and Perspectives | IEEE Journals & Magazine | IEEE Xplore](#)