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Instant Eye Check-Up System using Artificial Intelligence

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ABSTRACT: First aid is the “help given to a sick or injured person until full medical treatment is available.” Instant eye checkup system is an Evidence-Based Medical (EBM) System with a goal to provide the users of the Android application an immediate help to detect the disease they are suffering from and to know the treatment to cure it. The system will take symptoms as input from the user using either questionnaire or image of eye and process the information and generate the name of disease and its treatment as output. This paper depicts the importance of artificial intelligence in the healthcare domain.

KEYWORDS: Medical, Patient, Expert System, Diagnosis, Disease.

I. INTRODUCTION

Medical Services has made great advances and continues to emerge. Artificial Intelligence in healthcare has reached to a point where it can replace jobs. The innovations made are unimaginable and it is possible because of an expert system. Expert System, a branch of artificial intelligence, is a software build with the help of experts like engineers, scientists, etc. This type of a software helps a non-expert user ask queries and then answers such queries with the help of the knowledge base made from the information from an expert. The most significant application of the expert system is medical diagnosis where the patient enters his symptoms and the system will diagnose the patient's illness. No doubt, an expert system is also known as an intelligent knowledge-based system (IKBS).

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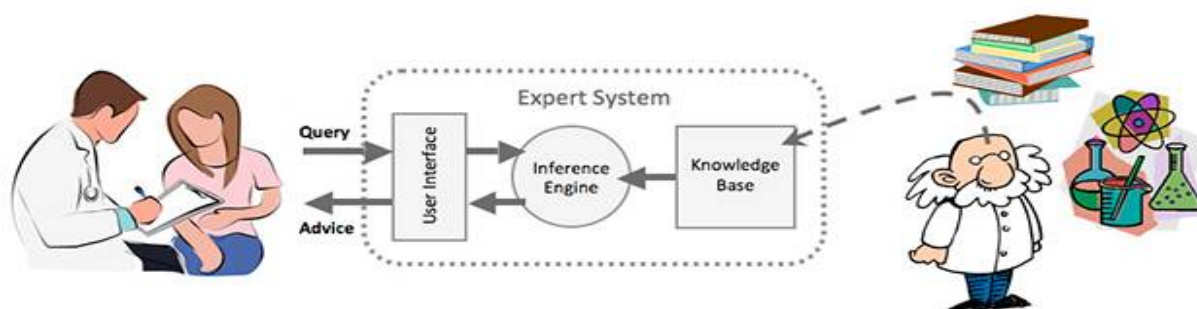


Fig 1: Expert System Working

II. OVERVIEW

Expert System does the work of decision-support-systems. For having decision support system, the system will have to collect information which can be collected using evidence-based practice and the part of the reasoning is done by the inference engine which will interact with the knowledge base and provide the solution. Clinical Decision Support System for Medical Diagnosis consists of the following:

- 1) User Interface- which will act as a mediator between the inference engine and the user.
- 2) Inference Engine- is the most important component of the Clinical Decision Support System. Work of an inference engine is to evaluate facts in the knowledge base and provide solution to the user. Inference engine uses either forward chaining or backward chaining to evaluate the facts. The inference collects information from viz; knowledge Base and patient's database.
- 3) Other Systems.

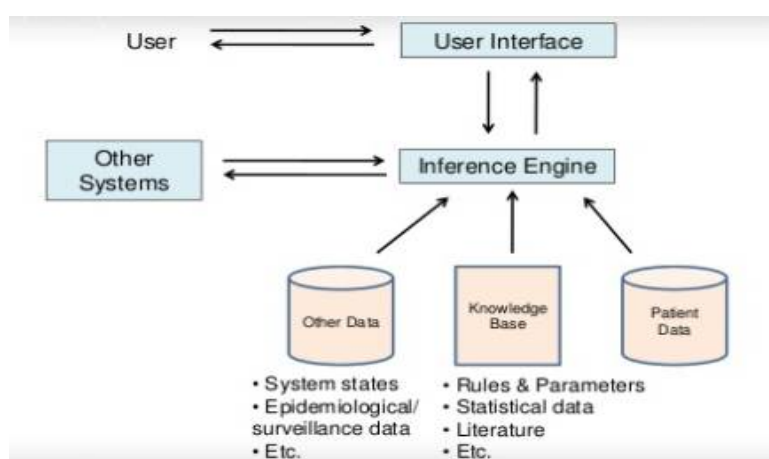


Fig 2: Clinical Decision Support System Architecture

III. SYSTEM DESCRIPTION

The system takes input from two options available. Either of the options can be used. First, questionnaire where the user needs to answer a sequence of questions. Based on his/her answers, the system will give diagnosis, the name of the most probable disease and also the treatment of the disease. The questionnaire will be in the form of set of rules which

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will consist of IF part that will have the symptoms and THEN part will have the disease that will be recognized using the knowledge base. The inference engine will then use either forward chaining or backward chaining mechanism to identify the disease.

Apart from symptom analysis through questionnaire, image analysis can also be done in which the system will ask the user to upload the image of its eye and hence, through image processing techniques, the image will be analysed and the diagnosis will be provided on that basis. Image analysis will include extraction of features from the image and then comparing the image with the image which will be present in the database, that is, pattern matching algorithms will be used to compare two images and suggest the name of the disease. Hence, this system will use pattern matching algorithms, decision trees, image processing techniques and data mining.

In questionnaire, the answers will decide the disease the person is suffering from. Any mistake in answering the questions will give the incorrect diagnosis. So, the user needs to be careful and patient enough to understand the question well and then answer. Because even a slight mistake can result into wrong diagnosis which can be fatal and life-threatening. For more accurate results, the user can go for image analysis. For image analysis, system will use image processing techniques to extract the features from the uploaded image and will give the name of the appropriate disease along with its treatment.

IV. CONCLUSION

The application of expert system in healthcare domain especially in medical diagnosis is very useful and crucial. The system will help both doctors and patients. Doctors can provide expert advice to the patient by inserting information in the knowledge base and patients will get instant suggestions of the required treatment using this application. There are also certain places where it is difficult to get the treatment at the right time. For these conditions, this application will be very useful. The proposed system will give the disease name and its diagnosis based on: questionnaires or image comparison. The system will use data mining techniques to extract and process data from the database, image processing techniques to extract features from the image and also decision making to identify and detect the disease. The accuracy of the system will depend on the information present in the knowledge base and hence literature survey is a very important step in the whole process. The data present in the knowledge base should be verified with the expert, in this case, doctors or eye specialists. To enhance the system, we shall include detection of more eye diseases in the system.

REFERENCES

- [1] Russell, S. and P. Norvig, 2002. Artificial Intelligence: A Modern Approach, Prentice Hall, Second Edition.
- [2] Jackson, P., 1999. Introduction to Expert Systems, Harlow, England: Addison Wesley Longman. Third Edition.
- [3] Associate Prof., Samy S. Abu Naser, Abu Zaiter A. Ola, "An Expert System for diagnosing eye diseases using CLIPS", Journal of Theoretical and Applied Information Technology, pp. 923-930.
- [4] <https://www.slideshare.net/UdaraSeneviratne/eye-disease-expert-system-30356885>
- [5] Gaurav Kumar, Pradeep Kumar Bhatia, "A Detailed Review of Feature Extraction in Image Processing Systems", 2014 Fourth International Conference on Advanced Computing & Communication Technologies, pp. 5-12.
- [6] Fatimah Ibrahim, Juliana Basheer Ali, Fathilah Jaais, and Mohd Nasir Taib, "Expert System for Early Diagnosis of Eye Diseases Infecting the Malaysian Population", IEEE Catalogue No. 01 CH37239, pp. 430-432.
- [7] Rahmad Kurniawan, Novi Yanti, Mohd Zakree Ahmad Nazri, Zulvandri, "Expert Systems for Self-Diagnosing of Eye Diseases Using Naïve Bayes", 2014 International Conference of Advanced Informatics: Concept, Theory and Application (ICAICTA), pp. 113-117.
- [8] Rimpny Nohria, "Medical Expert System- A Comprehensive Review", International Journal of Computer Applications (0975 – 8887), Volume 130 – No.7, November 2015, pp. 44-50.
- [9] Langston, DB. (1988). "Manual of Ocular Diagnosis and Therapy", Little Brown Company, Boston.
- [10] Hillol Das, Ashim Saha, Suman Deb, "An expert system to distinguish a defective eye from a normal eye", 2014 International Conference on Issues and Challenges in Intelligent Computing Techniques (ICICT), pp. 155-158.