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Breast Cancer Diagnosis and Treatment of Prophetic Medicine Using Expert System

Nouf Mohammad Al Zahrani*
Department of Computer Science and Engineering
Yanbu University College, Saudi Arabia

Safeeullah Soomro*
Institute of Business and Technology, Biztek, Karachi, Pakistan

Abdul Ghafoor Memon*
Institute of Mathematics & Computer Science,
University of Sindh, Pakistan

ABSTRACT

Artificial intelligence(AI) is part of computer science .The most power full branches of Artificial intelligence (AI) is focusing on system which can solve problems in specific domain as expert people do . This system found to summarize and represent the experiences of expert people as data or rules and stored in a program so that system can performs the same function of expertise in his work at the same level by giving information to the other people[1].This system called "Expert system." . The most people use term expert system rather than knowledge based system or knowledge based expert system because it is shorter. The first expert system was about analyze chemical compounds by the "father of expert systems", Edward Feigenbaum in 1965[2]. Now, expert systems have many application in many fields , such as medicine , agriculture, mining, electronics ,computer ,geology ,engineering ,education and commerce[3] .I want to take advantage of one paper. This paper is general diagnosis of disease[4]. Before discussing the research Let us take an overview of expert systems and the most important components.

1. INTRODUCTION

° The expert systems are expensive to build and maintain but they are cheaper to operate more than the doctors .

2. DIAGNOSIS DISEASE

The difference between diagnose in the doctor and the system.

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* Nouf Mohammad Al Zahrani : nouf.alzahrani.2011@gmail.com
* Safeeullah Soomro : safeeullah.soomro@biztekian.com
* Abdul Ghafoor Memon : ghafoor@usindh.edu.pk

A. Advantage…

° Expert systems can store more knowledge than the doctors and do not forget it.

° The expert system can access specialist knowledge that a doctor may not have.

° Increased distribution of expertise.

B. Disadvantage…

° The doctor have common sense .it is not yet known how to give expert systems common sense.

° The doctor can respond creativity to unusual situations. Expert system cannot .

° Doctor automatically adapt to changing environments. The expert system must be explicitly updated.

3. EXPERT SYSTEM ARCHITECTURE

A. Inference Engine

The inference engine is the important part of expert system and we can call it the heart of expert system. it can determine the appropriate knowledge in the knowledge base, and infers new knowledge by applying logical processing depend on the answers of user . (If and Else) is the method I will use it for diagnosis breast cancer. If the symptoms from type AG we can diagnosis the disease more strongly. If the symptoms from type BG we can diagnosis the disease less strongly. Then, we want from the user additional information. If the symptoms from type CG then we cannot diagnosis the disease . then, may be some of symptoms is missing.

B. Knowledge Base

The knowledge base stores group of facts and rules about a particular domain in same place. These facts and rules can describe all knowledge about diagnosis breast cancer. It makes these available to the inference engine in a form that it can use. The facts may be in the form of background information built into the system or facts that are input by the user during a consultation. The important facts in diagnosis domain is the symptoms. We can by symptoms confirm the disease. In breast cancer the symptoms are organized in groups, to help in diagnosis. There are three groups of symptoms .(AG) group of symptoms which is necessary to confirm the disease. (BG) group of symptoms which is subset of AG. (CG) group of symptoms which is not match with AG.

The User Interface

The user interface is the tool of communication between a user and the expert systems in diagnosis disease. The communication are in natural language. The system will ask questions to the user. Then, the answers of user passes in to the inference engine. Then, it can display the diagnosis to the user. The questions that the system will ask the user are groups. The system will ask the user personal information. Then, the family history because These cancers can be caused by mutations in particular genes. Also, genetic syndromes involving other cancers. And it can an increase risk of breast cancer . finally questions related to self diagnosis.

User Interface

1. Are you Female ?
   a. Yes
   b. No

2. Is your age 40 or more?
   a. Yes
   b. No

3. Do you have any chronically disease?
   a. Yes
   b. No

4. Does started menstruation before age 12?
   a. Yes
   b. No

5. Do you have children?
   a. Yes
   b. No

6. Was your pregnancy after the age of 30 years?
   a. Yes
   b. No

7. Have you noticed a change in the skin of your breast?
   a. Yes
   b. No

8. Through screening your self do you feel a lump in the breast tissue?
   a. Yes
   b. No

Do you have family history of any breast cancer?
   a. Yes
   b. No

9. Do you have family history of any breast cancer?
   a. Yes
   b. No

10. Do you have family history of any cancer?
   a. Yes
   b. No

11. Do you have personal history of any breast cancer?
   a. Yes
   b. No

4. LOGICAL CONCEPT

There are some important symptoms to diagnisi breast cancer. I will start to represent these symptoms in proposition logic. First,set of propositional variable B[i](i=1,2,3,4…,n) preceded or not by the symbol "¬". Second, set of logical connectives $\land$, $\lor$, $\neg$, $\Rightarrow$, $\Leftrightarrow$, if we need it. Symptoms are gathered with the conjunction " ^ " [5].

Determining Symptoms:
This group called Personal Information (PI)

B[1]= Age.
B[2]= Gender.
B[3]= Menstruation before12.
B[4]= Children.
B[5]= Chronically disease.
B[6]= pregnancy after 30.

This group called Self Exam (SE)

B[7]= Change skin.
B[8]= Lump in the breast tissue.

This group called Family History(FH)

B[9]= family breast cancer.
B[10]= Any family cancer.
B[11]= Personal breast cancer.

Mathematically,
B[1] B[2]   B[3]   B[4] B[5] B[6] → PI
B[7]   B[8] → SE
B[9] B[10] B[11]'FH

PI ^ SE ^ FH → AG
PI ^¬SE ^ FH → BG
¬PI ^¬SE ^¬FH → CG
¬PI ^ SE ^ FH→ CG

Algorithm :

If UD == AG   //we can diagnosis the cancer strongly.
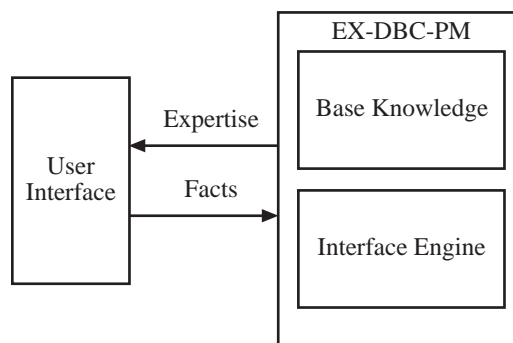
Else if UD == BG // we cannot diagnosis the cancer strongly.

Else if UD == CG   // we cannot diagnosis the cancer anymore.
then exit;
end if;

(UD-User Data)

Diagnosed
Female.
Age →45.
Chronically disease →Diabetes.
Menstruation after 12.
With children.
pregnancy before 30.
I have noticed change in the skin of breast.
I feel lump in the breast tissue.
There is family history cancer.

This is patient information. The system will diagnose her condition is it really infected or not, through the several questions posed by the system.

Symptoms		After apply or (V)
B[1]	→ 1	
B[2]	→ 1	
B[3]	→ 1	
B[4]	→ 0	→ 1
B[5]	→ 1	
B[6]	→ 0	
B[7]	→ 1	→ 1
B[8]	→ 1	
B[9]	→ 0	
B[10]	→ 1	→ 1
B[11]	→ 0	

(Boolean 1 and 0 are taken for TRUE and FALSE respectively.)

After the diagnosed part
PI ^ SE ^ FH→ AG
Indicate that the patient may suffer from breast cancer
she must see a doctor. To make initial biopsy (removal of tissue sample for testing). The result make up pathology report. The pathology will give the size and a appearance of the cancer. How it crows and any signs of spread the cancer.

5. BREAST CANCER DIAGNOSIS AND TREATMENT OF PROPHETIC MEDICINE (EX-DBC-PM SYSTEM).

Today the cancer diseases, especially breast cancer, grows fast, and it is the commonest cancer in women and is the second leading cause of cancer death. it occurs in nearly one out of eight women. The majority of women do not have awareness of the importance of early diagnosis. The rate of cure is a large proportion, if detected early[8]. In our expert system we chose narrow domain which is breast cancer. I mentioned narrow domain since it is quite difficult to encode enough knowledge into a system so that it may diagnosis a variety of disease . I have developed an expert system that It called as an Ex-DBC-PM (Expert system for Diagnosis of Breast Cancer and treatment by Prophetic Medicine). This system is written in object oriented programming language (Java). It can detecting the breast cancer disease at early stage can enable to overcome and treat them appropriately.

6. EXPERIENCE OF THE PROPHET MUHAMMAD PEACE BE UPON HIM IN THE MEDICAL FIELD.

There are a lot of expertise around the world. It Has been invested and take advantage of it in a variety ways, including books And programs. But there are experiences not take advantage of them. For example, experience of the Prophet Muhammad peace be upon him in the medical field and treatment of diseases. Through the design of specialized programs the experience can spread around the world for Muslims and others. Prophetic medicine or we can call it (TibbNabawi)mean word and actions of the prophet with disease and treatment of disease.

It covers preventive medicine, curative medicine, mental well-being, spiritual cures or ruqyah. Also, included general guidance on physical and mental health that are applicable to all places, all times, and all circumstances. Our sources are from books of hadith and sira. Bukhari in his sahih narrated 129 hadiths directly related to medicine[7].

7. AN EXPERT SYSTEM FOR DIAGNOSIS OF HUMAN DISEASES.

A. Advantage

• this research is very simple for reader and clearly distinguished the basic idea. And the reader can understand the main idea . And does not require any understanding in scientific field.

• In this research they used Logical concept (proposition logic) to determining factor and Severity of diseases. The representation of knowledge in proposition logic is important to build any expert system.

B. Disadvantage

• I think diagnosis filed should be in limited domain. This research is for diagnosis all human disease. In my research I choose to talk about specific domain which is breast cancer.

• "Prevention is better than cure" the prevention part is important in any research for diagnosis disease. In my research there are two type for risk factor. Risk factor you can control. For example, weight, diet, exercise, smoking , stress and anxiety[6]. Also, the prophetic medicine effective in the prevention of breast cancer. The messenger of allah may allah bless him and grant him peace (to cure honey and theQuran).

8. CONCLUSION

The important thing that when all countries start to know the necessary of transfer these expertise through programs for all people in our world. Then, dependence of the expert can be minimized if its expertise can be documented into a computer system. I think it is a new communication channel for knowledge that can be helpful for our society. Through it we can improve the quality of medical services. On the other hand , the treatment by prophet medicine in my program facilitate the transfer of experience of prophet Mohammed peace be upon him in medical field to remote locations. maybe they do not know about him.

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