

وزارة التعليم العالي والبحث العلمي

جامعة ديالى

كلية التربية للعلوم الصرفة

قسم علوم الحاسوب

## نظام خبير لتشخيص

## أمراض الجهاز الهضمي

بحث مقدم الى كلية التربية للعلوم الصرفة كجزء  
من متطلبات الحصول على شهادة البكالوريوس في  
علوم الحاسوب

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١٤٣٧هـ

٢٠١٦م

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

( قل هل ننبئكم بالأخسرين أعمالا ( ١٠٣ ) الذين ضل سعيهم  
في الحياة الدنيا وهم يحسبون أنهم يحسنون صنعا ( ١٠٤ )  
أولئك الذين كفروا بآيات ربهم ولقائه فحبطت أعمالهم فلا نقيم  
لهم يوم القيامة وزنا ( ١٠٥ )

صدق الله العظيم



# الإمام

الى ...

سراج الامة المنير، وشفيعها النذير البشير

محمد (صلى الله عليه وسلم) فخرا واعتزازا

الى ...

من سهر الليالي ونسي الغوالي وظل سندنا الموالي وحمل همنا غير مبالي

بدر التمام ... والدنا الغالي

الى ...

من اثلقت الجفون سهرا ... وحملت الفؤاد هما ... وجاهدت الايام صبيرا ... وشغلت البال

فكرا ... ورفعت الايادي دعاء ... وايقنت بالله املا

اغلى الغوالي واحب الاحباب ... امنا العزيزة الغالية

الى ...

ورود الحبة ... وينايع الوفاء ... الى من رافقوني في السراء والضراء

الى اصدق الاصحاب ... اخوتي واخواتي

الى ... القلعة الحصينة التي الجأ اليها عند شدتي

اصدقائي الاعزاء

تهدي ثمرة جهدنا المتواضع



شكر وتقدير

أتقدم بخالص التقدير إلى كل أساتذتي الأفاضل  
في كلية التربية العلوم الكوفة (قسم علوم الحاسبات) لما  
بذلوه في سبيل العلم .

إلى الذي بذل كل جهد وعطاء لكي أطل إلى هذه  
الخدمة الدكتور الفاضل عادل عبد الفزي عبد  
الوهاب ، الذي تفضل وتكرم بالإشراف على هذا  
البحث ولم يبخل بوقته وعلمه .

وشكر تقدير وامتنان إلى كل من ساعدنا في بحثنا  
هذا ...



## اقرار المشرف

أشهد ان هذا البحث الموسوم (نظام خبير لتشخيص أمراض الجهاز الهضمي) جرى تحت اشرافي في قسم علوم الحاسوب كلية التربية للعلوم الصرفة في جامعة ديالى .



م.م. عادل عبد الغني عبد الوهاب

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## Research abstract

In this research was performed intelligent software works for you expert system to diagnose system diseases Digestive .There of four main parts of an internal knowledge base and include diseases and Symptoms .Machine conclusion diagnosis Disease .And laws interface includes a conversation between the user and the calculator for determining the symptoms of the disease. In addition to any external knowledge base outside the program are configured during the diagnosis, according to his answers and his conversation with Computer .And Thus, the program depends on the diagnosis of one of matching the patient's symptoms with symptoms of the disease and assigned a 70% .We Act write the program in a language prolog to give it flexibility in the logical conclusion as the language of artificial intelligence language..

## الخلاصة

في هذا البحث تم تنفيذ برنامج ذكي يعمل ك نظام خبير لتشخيص أمراض الجهاز الهضمي. يتكون من أربعة أجزاء رئيسية وهي قاعدة المعرفة الداخلية وتتضمن الأمراض وأعراضها. وماكنة أستنتاج تتضمن قوانين أستنتاج تشخيص المرض. و واجهة محادثة ما بين المستخدم والحاسبة لاجل تحديد أعراض المرض. بالإضافة الى قاعدة المعرفة خارجية أي خارج البرنامج يتم تكوينها أثناء التشخيص بحسب أجاباته و محادثته مع الحاسبة. و هكذا يعتمد البرنامج في تشخيصه على إحدى مطابقة أعراض المريض مع أعراض المرض المعين وبنسبة 70%. وتم كتابة البرنامج بلغة prolog لما تعطيه من مرونة في الأستنتاج المنطقي كلغة من لغات الذكاء الاصطناعي..

## Key words

1. expert systems components
2. advantages of expert systems
3. the reasons for the non-proliferation expert systems

# CHAPTER ONE

## 1. Introduction

One of the most powerful branches of artificial intelligence, which is a stronger role branches of Computer Science.

Are programs that mimic the performance of the human expert in a particular field of expertise, and through the collection and use of information and experience one or more experts in a particular field.

In short, these systems created in order to draw experiences experts in rare specialties - and annexed in expert solves the human place and help in the transfer of these experiences to other people system in addition to its ability to solve problems faster than a human expert manner.

### 1.1 expert systems components

#### 1. Subsystem for knowledge

The subsystem for compiling knowledge

Experience relating to resolve the issue and transfer of knowledge and turn it into a source of knowledge base

Existing computer and includes Expropriated knowledge experts and studies, databases and reports

Own images and research, and is considered to have expert knowledge of a difficult task and requires

Help of engineer with knowledge of the expert knowledge base building.

## 2. Knowledge Base

Knowledge necessary to understand and define the knowledge base, problem solving include, and smell the two main components.

Facts and theories about the problem, and procedures or rules governing the use of control.

Those facts in solving specific problems. The information is entered in the knowledge base.

In a computer program through a process called knowledge representation.

### 3. inference machine

The inference is considered as a reason for the machine expert systems, which are

Is a program that provides a methodology to reflect on the information in the knowledge base and in the workplace and prepare Recommendations. And bearings

Knowledge about how to use the system by setting the agenda, which regulates and monitors the stages

A, taken to solve problems when you request consultation system It includes machine.

Heuristics are three main components

a translator and implement the elements of the selected works through the application of knowledge base rules.

B, The scheduler saves in control of the agenda and the assessment of the impact of the application of the rules of inference in light of the priorities or other criteria in the agenda

C, Consistency port works to maintain a consistent representation of the proposed solution.

## 4. workplace

The painting or workplace area in memory allocated to describe the current problem, as determined by the input data are also used in the registration of judgments and decisions and intermediate results.

## 5. Environmental Surface

Enabling expert systems to facilitate communication with the system user and these contacts are natural language may be available through the menus and graphics.

## 6. Subsystem for clarification

This sub-system expert system provides the ability to clarify the causes on which the issue is resolved through the program shows the user and explains the reasons

Access to this solution, and the system can be explained by expert behavior of the system by answering questions such as:

-How it was reached to a certain description of the problem ?

-What are the reasons for rejection of certain alternative?

## 7. Revision of the knowledge system

Experts of individuals have the ability to self-evaluate their performance and learn from their experiences and modify their knowledge and use them in the future consulting. Expert systems also need for such capacity and that by providing them with The possibility of

renovation facts in addition to, or modification in or cancellation of them not only that but also need to have expert possibility of evaluating the reasons for failure or success of the proposed solutions and in which they can improve the knowledge base, but the latter property is still the place experiences in many centers and institutes systems research.

## 1.2 advantages of expert systems

1. It is easy to use for any user, whether a regular user or developer.
2. They are useful in the field of application clearly..
3. able to learn from the experts directly and indirectly..
4. able to teach non-specialists..
5. able to interpret any solutions reached by with surrounding accessible way.
6. able to respond to simple questions, as well as in complex application limits.
7. a useful tool in providing high levels of expertise in the event of unavailability of an expert.
- 8.able to develop the performance of specialists with experience Statistics.

## 1.3 the reasons for the no proliferation expert systems.

1.It is high cost compared to conventional applications.

2.limited application in the administrative systems and integrated information retrieval system.

However, these problems, however there are strong reasons why some companies overcome these

A. retain the expertise and knowledge from extinction or extinction, especially in the use of the many rare or important disciplines.

B. solve the problems, which saves time and money and effort.

C. Increase the experts in the field of expert system application.

## 1.4 One of the main areas of expertise system applications is the classification

Where the system is required to determine the category to which he belongs Ranked desired object, and expert systems entered in several other areas such as medicine, agriculture and exploration, electronics, computers, geology, engineering, education, law, law, trade and economy, and many others.

## 1.5 To produce an expert system must provide two important elements.

1. programmer who analyze the problem and write the program in the field of artificial intelligence.
2. domain expert, a specialist in a particular area and the person does not have to be aware of what is important is the extent of AI experience and familiarity with insider in his field.

## 1.6 Expert System stages

1. Definition of the application: where is and determine what we want from the system and area of expertise.
2. System design.
3. System Programming
4. System test and documented

Each of these steps the persons in charge to do it

## 1.7 Examples of expert systems

Eliza system psychotherapy: It is a system being a dialogue with the user and respond to inquiries as a psychiatrist expert.

## 1.8 What is Artificial intelligence

Artificial intelligence is the behavior of certain characteristics called by the software makes it simulates human mental abilities and patterns of work. The most important of these properties the ability to learn and the conclusion and the reaction to the situation was not programmed in the machine. However, this term is a dialectical view of the lack of a specific definition of intelligence.

ASIMO sensors and intelligent algorithms used to avoid obstacles and moving stairs.

Artificial intelligence branch of computer science. Know a lot of the compositions of artificial intelligence as "the study and design of intelligent customers", and the customer is the smart system to accommodate its environment and take positions that increase the chance of success

## CHAPTER TWO

### 2. Research goals

1. Assist in the acceleration of the work of hospitals in the side of the diagnosis of disease that affects the digestive system
2. Give an idea for the user that the language is the language of artificial intelligence possible. Employ it. And It is flexible. And Try to remove some perception adaptation of the language
3. Simplify the diagnostic process so that it becomes a form of finding a fixed program and easy to use
4. The main goal of the program is still to be a substitute for the human side of medicine

## CHAPTER THREE

### 3. Research problem

The problem lies in the slow search found when doctors diagnose diseases that afflict Appliance Digestive . device the slow time when Diagnosis .Ditto try to minimize as much as possible from the time when Diagnosis . Ditto extremely difficult when direct diagnosis and try to find a substitute for this work so easy to learn and work with. duty mention here that the title search is a problem looking for a solution to . disease is a problem

## 3.1 Digestive system diseases and symptoms.

### 1. Ulceration of the large intestine

Symptoms.

diarrhea frequently corresponds with hemorrhage ..  
and snotty with abdominal pain and fever.

### 2. colon duodenal Adenitis.

Symptoms

Diarrhea pain in the upper part of the abdomen.

### 3 . Ulcer

Symptoms

- A. The patient feeling a little pain in the stomach or hot.
- B. weight loss.
- C. loss of appetite.
- D. Puff.
- E. Vomiting.

## 4. Cholera

### Symptoms

- A. Dryness of mucous membranes.
- B. Low blood pressure.
- C. Muscle spasm.
- D. Thirst.
- E. Vomiting.

## 5 . Food Poisoning

### Symptoms

- A. Feeling unwell.
- B. vomiting.
- C. Diarrhea.
- D. Colic.
- E. Lack or loss of appetite.
- f. Fever

## CHAPTER FOUR

### 4. Research Methodology

When initiating the work of the practical part of the program to set up .We Acted Machine Inference And Base Discerning . inference and are considered two main parts of a program written by the language of intelligence Artificial .hat we have diseases and their symptoms into the machine, which is inferred systematic thinking or body building program or Program . And We establish a knowledge base to serve as a key for machine reasoning to solve problems Inventory .whereat can find out the disease soon as you type any of the symptoms .

The idea behind the program to set up an expert system using the language of intelligence Artificial .We Acted have diseases and symptoms in the machine so as to be inferred when implementing the answer either YES OR NO. When you type any of the symptoms, the program will pass through the digestive system diseases Involuntarily .And over the disease did not find these symptoms are the answer NO and if we find the

symptoms are the answer. if YES was in similar symptoms in more than one disease, the answer is YES upon execution The Program It Is

domains

S=symbol

database

symptom2(S,S)

predicates

symptom1(S,S)

symptom(S)

disease(S)

diagnoses

go

goal

go.

clauses

symptom1(X,Y):-symptom2(X,Y),!

symptom1(X,Y):-write("are you suffer from ",X,"(Y,N): "),  
read in (Y),assert(symptom2(X,Y)).

symptom(X):-symptom1(X,Y),Y=y.

disease("ulceration of the large intestine"):-  
symptom("diarrhea frequently corresponds"),  
symptom("hemorrhage and snotty"),  
symptom("abdominal pain and fever").

disease("stomach and colon duodenal ulces"):-  
symptom("sharp pain in the upper part of the abdomen"),

disease("peptic ulcer"):-

```
symptom("the patient feeling a little pain in the stomach or hot"),
    symptom("weight loss"),
    symptom("loss of appetite"),
    symptom("puff"),
    symptom("vomiting").
```

```
disease("cholera):-symptom("dryness of mucous membranes"),
    symptom("low blood pressure"),
    symptom("muscle spasm"),
    symptom("thirst"),
    symptom("vomiting").
```

```
disease("food poisoning):-symptom("feeling unwell"),
    symptom("vomiting"),
    symptom("diarrhea"),
    symptom("colic"),
    symptom("lack or loss of appetite"),
    symptom("fever").
```

```
diagnoses:-disease(X),write("You are suffer from ",X).
```

```
diagnoses:-write("I can not recognize this disease ").
```

```
go:-ret tall(symptom2(_,_)),
```

```
    make window(1,3,13,"Risperatory system",0,0,25,80),
```

```
    diagnoses.
```

are you suffer from weight loss (y ,n):n

are you suffer from loss appetite(y ,n):n

are you suffer from puff(y ,n):n

are you suffer from vomiting(y , n):n

are you not suffer from peptic ulcer.

are you suffer from low blood pressure(y, n):n

are you suffer from muscle spasm(y, n):n

are you suffer from thirst(y, n):y

are you suffer from cholera.

are you suffer from sharp pain in the upper part of the abdomen  
(y ,n):y

are you suffer from stomach and colon duodenal ulcer.

## CHAPTER FIVE

### 5. Conclusions and Recommendations

#### 5.1 Conclusions

1. We concluded that the language of artificial intelligence is dry and tough language customary between people but it is of great interest.

2. as it depends on Exercising.

3. Educating perception that computer programming intervenes in any field as an important catalyst.

#### 5.2 Recommendations

1. I see that do not neglect the language of artificial intelligence in terms of the establishment of educational sessions, as well as lessons Extra.

2. see the necessity to call computer programmers by hospitals and make them as a key factor in the management Crew.

## Resources

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