تصميم منظومة [أستحصال- أستنتاج] معتمده على الوكيل

رسالة مقدمة من

هيفاء طالب حسين أبوكلل

إلى مجلس كلية العلوم - جامعة بابل

كجزء من متطلبات نيل درجة الماجستير في علوم الحاسبات

بأشراف

الأستاذ **الأستاذ المساعد**

د. نبيل هاشم الأعرجي **د. عباس محسن البكري**

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Design a Web – Based Agent Acquisition – Reasoning System

A Thesis

Submitted by

Hayfa'a Taleib Hussein Abu - koulel

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Supervised by

Dr. Nabeel H. Kaghad **Dr. Abbas M.Al-Bakry**

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بسمِ ٱللهِ ٱلرَحمَنِ ٱلرحَيمِ

إِنا أَعطَينَاكَ الكوثر{١} فَصلِّ
لرِبكَ وَانحَر{٢} إِنَ شَانِئَكَ هُوَ
الأَبتَرُ{٣}

صدق الله العلي العظيم

صورة الكوثر

الخلاصـــة

يتناول البحث تصميم نظام له القدرة على اكتساب المعرفة من الخبراء بطريقة مؤتمتة وذلك من خلال استخدام وكيل المعرفة الذكي ، و يتفاعل النظام مع المستخدم لإعطاء الاستنتاج المناسب من خلال استخدام الشبكات العصبية والمنطق المضبب .ان النظام المقترح يتالف من جزئين هي :

الجزء الأول: يتم فيه نشر نموذج مصمم بشكل صفحة انترنيت لغرض إملائها من قبل الخبراء بعد منحهم الصلاحية ،حيث يقوم نظام الوكالة بعملية استخلاص المعرفة من هذه الصفحات او من قاعدة بيانات معدة مسبقا ومنشورة على الانترنيت مناسبة لنفس الحقل العلمي ويتم هيكلتها بشل قواعد (***Rules***)وتخزن بهيئة فايل قاعدة معرفة محدث.اما الجزء الثاني: يتم فيه استخدام المنطق المضبب للتعامل مع المفردات ذات التعبير الغير دقيق والغير محدد واسخدمنا الشبكات العصبية نوع (***back propagation neural network***) لقواعد التعلم المعتمدة على بيانات المدخل المضبب لاعطاء الاستنتاج المناسب .

ان النظام المقترح له المميزات التالية :

١- دقة عالية لقاعدة المعرفة المكتسبة التي تم بنائها .
٢- الغاء دور مهندس المعرفة الذي يكلف الكثير من الوقت والكلفة .
٣- الحصول على مجموعة من الخبرات المجمعة لعدد من الخبراء ونشرها لغرض الاستفادة منها من قبل المستخدمين .
٤- النظام يكون (مباشر) في عملية الاستنتاج

Abstract

In this thesis a system that implementing the knowledge acquisition from many experts using automated method, depending on intelligent knowledge agency has been designed. The system interacts with the users to give the required reasoning using neural network and fuzzy logic.

The suggested system includes two parts:

The first part includes the design of formal formats published as a web page on the internet to be filled by the domain expert after they get authorized. The intelligent agent will extract knowledge from these pages or from a ready published data base which is suitable for a specific filed. The knowledge will be structured as rules to be stored as modified knowledge base file.

The second part includes the fuzzy logic was used to treat the un-précised and undetermined knowledge and Neural network was trained using *(back propagation neural network)* learning rules depend on the fuzzy input in order to perform a suitable reasoning.

This suggested system has the following features:

١. **High accuracy to acquisition Knowledge base.**

٢. **Neglecting the effect of the Knowledge engineer, which needs a lot of cost and time.**

٣. **Getting a collection of accumulated experiences which have been taken from the experts published on the internet.**

٤. **The system (on-line) in the reasoning process.**

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Hayfa'a

Appendix A

- ***Rules Extraction***

INF(AND,Acute Pericarditis,Acute chest Pain,pos,R١-١,pos,٠.٨) INF(AND,R١-١,blood pressure,pos,R١-٢,pos,٠.٦) INF(AND,R١-٢,Chest pain relief by rest,neg,R١-٣,neg,٠.٩) INF(AND,R١-٣,dyspnoea on extersion,neg,R١-٤,neg,٠.٩) INF(AND,R١-٤,Generlized weakness,pos,R١-٥,pos,٠.٩) INF(AND,R١-٥,grad fever,neg,R١-٦,neg,٠.٧) INF(AND,R١-٦,Pericardial effusion,pos,R١-٧,pos,٠.٩) INF(AND,R١-٧,Syncopal attack,neg,R١-٨,neg,١)
INF(AND,Acute Rheumatic Fever,blood pressure,pos,R٢-١,pos,٠.٥) INF(AND,R٢-١,Breadycardia,pos,R٢-٢,pos,٠.٧) INF(AND,R٢-٢,dyspnoea on extersion,pos,R٢-٣,pos,٠.٩) INF(AND,R٢-٣,Generlized weakness,neg,R٢-٤,neg,٠.٨)

INF(AND,R٢-٤,grad fever,neg,R٢-٥,neg,٠.٦)
INF(AND,R٢-٥,Nausea,pos,R٢-٦,pos,٠.٨)
INF(AND,R٢-٦,pleurtic chest pain,neg,R٢-٧,neg,٠.٦)
INF(AND,R٢-٧,Sweating,pos,R٢-٨,pos,٠.٩)
INF(AND,R٢-٨,Syncopal attack,pos,R٢-٩,pos,١)
INF(AND,R٢-٩,THmboembolic Phenomena,pos,R٢-١٠,pos,٠.٦)
INF(AND,R٢-١٠,Vomiting,pos,R٢-١١,pos,١)

INF(AND,Angina Pectoris,Abdominal Pain,neg,R٣-١,neg,٠.٨)
INF(AND,R٣-١,Acute chest Pain,neg,R٣-٢,neg,١)
INF(AND,R٣-٢,Anorexea,pos,R٣-٣,pos,٠.٥)
INF(OR,R٣-٣,blood pressure,pos,R٣-٤,pos,٠.٦)
INF(OR,R٣-٤,Chest pain relief by rest,neg,R٣-٥,neg,٠.٩)
INF(AND,R٣-٥,dyspnoea on extersion,neg,R٣-٦,neg,٠.٥)
INF(AND,R٣-٦,Generlized weakness,neg,R٣-٧,neg,٠.٧)
INF(AND,R٣-٧,Headach,neg,R٣-٨,neg,١)
INF(AND,R٣-٨,Nausea,pos,R٣-٩,pos,٠.٧)
INF(OR,R٣-٩,Palpitation,neg,R٣-١٠,neg,٠.٦)
INF(AND,R٣-١٠,Paroxysmal noctural dyspnoea,neg,R٣-١١,neg,٠.٨)
INF(AND,R٣-١١,Sweating,neg,R٣-١٢,neg,٠.٧)

INF(AND,Aortic Dissection,Acute chest Pain,pos,R٤-١,pos,٠.٧)
INF(AND,R٤-١,blood pressure,pos,R٤-٢,pos,٠.٦)
INF(AND,R٤-٢,Breadycardia,neg,R٤-٣,neg,٠.٨)
INF(AND,R٤-٣,dyspnoea at rest,neg,R٤-٤,neg,٠.٧)
INF(AND,R٤-٤,Generlized weakness,pos,R٤-٥,pos,٠.٦)
INF(AND,R٤-٥,Nausea,pos,R٤-٦,pos,٠.٧)
INF(AND,R٤-٦,Peripheral Oedema,neg,R٤-٧,neg,١)
INF(AND,R٤-٧,Sweating,pos,R٤-٨,pos,٠.٨)
INF(AND,R٤-٨,Syncopal attack,neg,R٤-٩,neg,٠.٥)
INF(AND,R٤-٩,Vomiting,pos,R٤-١٠,pos,٠.٨)

INF(AND,Aortic Stenosis,Acute chest Pain,pos,R٥-١,pos,٠.٩)
INF(AND,R٥-١,blood pressure,neg,R٥-٢,neg,٠.٨)
INF(AND,R٥-٢,Chest pain relief by rest,pos,R٥-٣,pos,٠.٧)
INF(AND,R٥-٣,dyspnoea on extersion,pos,R٥-٤,pos,٠.٨)
INF(AND,R٥-٤,Generlized weakness,pos,R٥-٥,pos,٠.٧)
INF(AND,R٥-٥,Headach,neg,R٥-٦,neg,٠.٧)
INF(AND,R٥-٦,Hepatomegaly,neg,R٥-٧,neg,٠.٥)
INF(AND,R٥-٧,Orthopnoea,neg,R٥-٨,neg,١)
INF(AND,R٥-٨,Palpitation,neg,R٥-٩,neg,٠.٧)
INF(AND,R٥-٩,Peripheral Oedema,neg,R٥-١٠,neg,٠.٧)
INF(AND,R٥-١٠,Pleural effusion,neg,R٥-١١,neg,٠.٧)

INF(AND,R٥-١١,Pulmonory Oedema,neg,R٥-١٢,neg,٠.٨)
INF(AND,R٥-١٢,Syncopal attack,pos,R٥-١٣,pos,٠.٦)
INF(AND,R٥-١٣,Tachy pnoea,pos,R٥-١٤,pos,٠.٨)

INF(OR,Atrial Fibrillation,Acute chest Pain,pos,R٦-١,pos,٠.٧)
INF(OR,R٦-١,blood pressure,neg,R٦-٢,neg,٠.٩)
INF(AND,R٦-٢,dyspnoea at rest,neg,R٦-٣,neg,٠.٩)
INF(AND,R٦-٣,Generlized weakness,pos,R٦-٤,pos,٠.٩)
INF(AND,R٦-٤,Headach,neg,R٦-٥,neg,٠.٦)
INF(AND,R٦-٥,Palpitation,neg,R٦-٦,neg,٠.٦)
INF(AND,R٦-٦,Pulmonary oedema,neg,R٦-٧,neg,٠.٦)
INF(OR,R٦-٧,Strock,neg,R٦-٨,neg,٠.٨)
INF(OR,R٦-٨,Syncopal attack,pos,R٦-٩,pos,٠.٨)
INF(AND,R٦-٩,Tachy pnoea,pos,R٦-١٠,pos,٠.٥)
INF(AND,R٦-١٠,Thmboembolic Phenomena,neg,R٦-١١,neg,٠.٨)
INF(AND,R٦-١١,Vomiting,neg,R٦-١٢,neg,٠.٧)

INF(AND,Atrial Septal Defect,dyspnoea at rest,neg,R٧-١,neg,٠.٩)
INF(AND,R٧-١,Generlized weakness,pos,R٧-٢,pos,٠.٨)
INF(AND,R٧-٢,Orthopnoea,neg,R٧-٣,neg,٠.٩)
INF(AND,R٧-٣,Palpitation,neg,R٧-٤,neg,٠.٧)
INF(OR,R٧-٤,Paroxysmal noctural dyspnoea,neg,R٧-٥,neg,٠.٦)
INF(AND,R٧-٥,Peripheral Oedema,neg,R٧-٦,neg,٠.٥)
INF(AND,R٧-٦,Syncopal attack,pos,R٧-٧,pos,٠.٦)

INF(AND,Chronic Constrictive Pericarditis,Acute chest Pain,pos,R٨-١,pos,٠.٥)
INF(AND,R٨-١,Asicitis,neg,R٨-٢,neg,٠.٦)
INF(AND,R٨-٢,dyspnoea at rest,pos,R٨-٣,pos,٠.٩)
INF(AND,R٨-٣,Generlized weakness,neg,R٨-٤,neg,٠.٨)
INF(OR,R٨-٤,Headach,neg,R٨-٥,neg,٠.٥)
INF(AND,R٨-٥,Hepatomegaly,neg,R٨-٦,neg,٠.٧)
INF(AND,R٨-٦,Incresed Jegular Venons Pressure(JVP),pos,R٨-٧,pos,٠.٦)
INF(AND,R٨-٧,Nausea,neg,R٨-٨,neg,٠.٧)
INF(AND,R٨-٨,Palpitation,neg,R٨-٩,neg,٠.٧)
INF(AND,R٨-٩,Pericardial effusion,neg,R٨-١٠,neg,٠.٧)
INF(AND,R٨-١٠,Peripheral Oedema,neg,R٨-١١,neg,٠.٩)
INF(AND,R٨-١١,Syncopal attack,pos,R٨-١٢,pos,٠.٩)
INF(AND,R٨-١٢,Tachy pnoea,pos,R٨-١٣,pos,٠.٧)
INF(OR,R٨-١٣,THmboembolic Phenomena,pos,R٨-١٤,pos,٠.٥)
INF(OR,R٨-١٤,Vomiting,pos,R٨-١٥,pos,٠.٧)

INF(AND,Dilated Cardiomyo pathy,Acute chest Pain,pos,R٩-١,pos,٠.٦)
INF(AND,R٩-١,Asicitis,pos,R٩-٢,pos,٠.٨)

INF(AND,R٩-٢,dyspnoea on extersion,neg,R٩-٣,neg,٠.٦)
INF(AND,R٩-٣,Generlized weakness,neg,R٩-٤,neg,٠.٦)
INF(AND,R٩-٤,Haemoptysis,pos,R٩-٥,pos,٠.٦)
INF(AND,R٩-٥,Palpitation,neg,R٩-٦,neg,٠.٧)
INF(AND,R٩-٦,Pericardial effusion,pos,R٩-٧,pos,١)
INF(AND,R٩-٧,Tachy pnoea,pos,R٩-٨,pos,٠.٧)
INF(AND,R٩-٨,THmboembolic Phenomena,pos,R٩-٩,pos,٠.٩)

INF(OR,Heart Failure,Acute chest Pain,pos,R١٠-١,pos,٠.٩)
INF(AND,R١٠-١,Anorexea,pos,R١٠-٢,pos,٠.٧)
INF(AND,R١٠-٢,Asicitis,neg,R١٠-٣,neg,٠.٧)
INF(AND,R١٠-٣,blood pressure,pos,R١٠-٤,pos,٠.٦)
INF(AND,R١٠-٤,Breadycardia,neg,R١٠-٥,neg,٠.٨)
INF(AND,R١٠-٥,Clubbing of Fingers,pos,R١٠-٦,pos,٠.٨)
INF(AND,R١٠-٦,dyspnoea at rest,neg,R١٠-٧,neg,٠.٨)
INF(AND,R١٠-٧,dyspnoea on extersion,neg,R١٠-٨,neg,٠.٨)
INF(OR,R١٠-٨,Generlized weakness,neg,R١٠-٩,neg,٠.٨)
INF(AND,R١٠-٩,Headach,pos,R١٠-١٠,pos,٠.٧)
INF(AND,R١٠-١٠,Hepatomegaly,neg,R١٠-١١,neg,٠.٦)
INF(AND,R١٠-١١,Incresed Jegular Venons Pressure(JVP),neg,R١٠-١٢,neg,٠.٨)
INF(AND,R١٠-١٢,Orthopnoea,neg,R١٠-١٣,neg,٠.٨)
INF(AND,R١٠-١٣,Paroxysmal noctural dyspnoea,neg,R١٠-١٤,neg,٠.٩)
INF(AND,R١٠-١٤,Pericardial effusion,neg,R١٠-١٥,neg,٠.٦)
INF(AND,R١٠-١٥,Peripheral Oedema,pos,R١٠-١٦,pos,٠.٩)
INF(AND,R١٠-١٦,Pleural effusion,pos,R١٠-١٧,pos,٠.٩)
INF(AND,R١٠-١٧,Pulmonory Oedema,neg,R١٠-١٨,neg,٠.٩)
INF(AND,R١٠-١٨,Strock,neg,R١٠-١٩,neg,١)
INF(AND,R١٠-١٩,Syncopal attack,neg,R١٠-٢٠,neg,٠.٥)
INF(AND,R١٠-٢٠,Tachy pnoea,pos,R١٠-٢١,pos,٠.٧)
INF(OR,R١٠-٢١,THmboembolic Phenomena,neg,R١٠-٢٢,neg,٠.٦)

INF(OR,Hypertension,Acute chest Pain,neg,R١١-١,neg,٠.٦)
INF(AND,R١١-١,Anorexea,neg,R١١-٢,neg,٠.٩)
INF(AND,R١١-٢,Asicitis,pos,R١١-٣,pos,٠.٨)
INF(AND,R١١-٣,blood pressure,neg,R١١-٤,neg,٠.٧)
INF(AND,R١١-٤,Chest pain relief by rest,pos,R١١-٥,pos,٠.٩)
INF(AND,R١١-٥,dyspnoea at rest,neg,R١١-٦,neg,١)
INF(OR,R١١-٦,dyspnoea on extersion,pos,R١١-٧,pos,٠.٥)
INF(AND,R١١-٧,Generlized weakness,pos,R١١-٨,pos,٠.٩)
INF(AND,R١١-٨,Headach,neg,R١١-٩,neg,٠.٧)
INF(AND,R١١-٩,Nausea,neg,R١١-١٠,neg,٠.٦)
INF(AND,R١١-١٠,Palpitation,pos,R١١-١١,pos,٠.٩)
INF(AND,R١١-١١,Pulmonory Oedema,pos,R١١-١٢,pos,٠.٧)

INF(AND,R١١-١٢,Recurrent epistaxis,pos,R١١-١٣,pos,٠.٦)
INF(AND,R١١-١٣,Strock,neg,R١١-١٤,neg,٠.٧)
INF(AND,R١١-١٤,Syncopal attack,pos,R١١-١٥,pos,٠.٦)
INF(AND,R١١-١٥,THmboembolic Phenomena,pos,R١١-١٦,pos,٠.٧)
INF(AND,R١١-١٦,Vomiting,neg,R١١-١٧,neg,٠.٦)

INF(AND,Hypertrophic Cardiomyopathy,blood pressure,neg,R١٢-١,neg,٠.٧)
INF(AND,R١٢-١,Chest pain relief by rest,pos,R١٢-٢,pos,٠.٨)
INF(AND,R١٢-٢,dyspnoea on extersion,neg,R١٢-٣,neg,١)
INF(AND,R١٢-٣,Generlized weakness,neg,R١٢-٤,neg,٠.٧)
INF(AND,R١٢-٤,Hepatomegaly,neg,R١٢-٥,neg,٠.٦)
INF(AND,R١٢-٥,Nausea,pos,R١٢-٦,pos,٠.٦)
INF(AND,R١٢-٦,Palpitation,pos,R١٢-٧,pos,١)
INF(AND,R١٢-٧,Peripheral Oedema,pos,R١٢-٨,pos,١)
INF(AND,R١٢-٨,Syncopal attack,pos,R١٢-٩,pos,٠.٧)

INF(OR,Infective Endocarditis,Acute chest Pain,pos,R١٣-١,pos,٠.٥)
INF(AND,R١٣-١,blood pressure,pos,R١٣-٢,pos,٠.٩)
INF(AND,R١٣-٢,Breadycardia,neg,R١٣-٣,neg,٠.٦)
INF(AND,R١٣-٣,Cynosis,neg,R١٣-٤,neg,٠.٧)
INF(AND,R١٣-٤,dyspnoea at rest,pos,R١٣-٥,pos,٠.٥)
INF(OR,R١٣-٥,dyspnoea on extersion,pos,R١٣-٦,pos,٠.٩)
INF(AND,R١٣-٦,Generlized weakness,pos,R١٣-٧,pos,٠.٧)
INF(AND,R١٣-٧,grad fever,pos,R١٣-٨,pos,٠.٩)
INF(AND,R١٣-٨,Headach,pos,R١٣-٩,pos,١)
INF(AND,R١٣-٩,Hepatomegaly,pos,R١٣-١٠,pos,٠.٧)
INF(AND,R١٣-١٠,Incresed Jegular Venons Pressure(JVP),neg,R١٣-١١,neg,١)
INF(AND,R١٣-١١,Nausea,pos,R١٣-١٢,pos,٠.٨)
INF(OR,R١٣-١٢,Sweating,neg,R١٣-١٣,neg,٠.٥)
INF(AND,R١٣-١٣,Tachy pnoea ,neg,R١٣-١٤,neg,٠.٦)
INF(AND,R١٣-١٤,THmboembolic Phenomena,pos,R١٣-١٥,pos,٠.٧)
INF(AND,R١٣-١٥,Vomiting,neg,R١٣-١٦,neg,٠.٦)

INF(AND,Mitral Stenosis,Acute chest Pain,pos,R١٤-١,pos,٠.٩)
INF(AND,R١٤-١,Asicitis,neg,R١٤-٢,neg,٠.٦)
INF(AND,R١٤-٢,Chest pain relief by rest,pos,R١٤-٣,pos,٠.٧)
INF(AND,R١٤-٣,dyspnoea at rest,neg,R١٤-٤,neg,٠.٩)
INF(AND,R١٤-٤,dyspnoea on extersion,neg,R١٤-٥,neg,٠.٧)
INF(AND,R١٤-٥,Generlized weakness,neg,R١٤-٦,neg,٠.٩)
INF(AND,R١٤-٦,Haemoptysis,pos,R١٤-٧,pos,٠.٧)
INF(AND,R١٤-٧,Headach,neg,R١٤-٨,neg,٠.٩)
INF(AND,R١٤-٨,Hepatomegaly,pos,R١٤-٩,pos,١)
INF(AND,R١٤-٩,Incresed Jegular Venons Pressure(JVP),pos,R١٤-١٠,pos,٠.٧)

INF(AND,R١٤-١٠,Nausea,pos,R١٤-١١,pos,٠.٦)
INF(AND,R١٤-١١,Orthopnoea,neg,R١٤-١٢,neg,٠.٦)
INF(AND,R١٤-١٢,Palpitation,neg,R١٤-١٣,neg,٠.٥)
INF(AND,R١٤-١٣,Peripheral Oedema,pos,R١٤-١٤,pos,٠.٩)
INF(AND,R١٤-١٤,Pleural effusion,neg,R١٤-١٥,neg,٠.٩)
INF(AND,R١٤-١٥,Pulmonory Oedema,neg,R١٤-١٦,neg,٠.٩)
INF(AND,R١٤-١٦,Strock,pos,R١٤-١٧,pos,٠.٧)
INF(AND,R١٤-١٧,Syncopal attack,neg,R١٤-١٨,neg,٠.٧)
INF(AND,R١٤-١٨,THmboembolic Phenomena,neg,R١٤-١٩,neg,٠.٩)
INF(AND,R١٤-١٩,Vomiting,neg,R١٤-٢٠,neg,٠.٩)

INF(AND,Myocardial Infarction,Abdominal Pain,neg,R١٥-١,neg,٠.٨)
INF(AND,R١٥-١,Acute chest Pain,pos,R١٥-٢,pos,٠.٦)
INF(AND,R١٥-٢,blood pressure,pos,R١٥-٣,pos,٠.٦)
INF(AND,R١٥-٣,Breadycardia,pos,R١٥-٤,pos,٠.٨)
INF(AND,R١٥-٤,Chest pain not relief by rest(continuos),pos,R١٥-٥,pos,١)
INF(AND,R١٥-٥,Cynosis,pos,R١٥-٦,pos,٠.٦)
INF(AND,R١٥-٦,dyspnoea at rest,pos,R١٥-٧,pos,٠.٥)
INF(OR,R١٥-٧,dyspnoea on extersion,neg,R١٥-٨,neg,٠.٩)
INF(AND,R١٥-٨,Generlized weakness,neg,R١٥-٩,neg,٠.٧)
INF(AND,R١٥-٩,grad Fever,neg,R١٥-١٠,neg,٠.٨)
INF(AND,R١٥-١٠,Headach,neg,R١٥-١١,neg,٠.٨)
INF(AND,R١٥-١١,Incresed Jegular Venons Pressure(JVP),neg,R١٥-١٢,neg,٠.٥)
INF(AND,R١٥-١٢,Nausea,pos,R١٥-١٣,pos,٠.٦)
INF(AND,R١٥-١٣,Palpitation,pos,R١٥-١٤,pos,١)
INF(AND,R١٥-١٤,Pericardial effusion,neg,R١٥-١٥,neg,١)
INF(AND,R١٥-١٥,Pleural effusion,pos,R١٥-١٦,pos,٠.٧)
INF(OR,R١٥-١٦,Pulmonory Oedema,neg,R١٥-١٧,neg,٠.٩)
INF(AND,R١٥-١٧,Strock,pos,R١٥-١٨,pos,٠.٧)
INF(AND,R١٥-١٨,Sweating,neg,R١٥-١٩,neg,٠.٧)
INF(AND,R١٥-١٩,Syncopal attack,neg,R١٥-٢٠,neg,٠.٦)
INF(AND,R١٥-٢٠,Tachy pnoea,pos,R١٥-٢١,pos,٠.٥)
INF(AND,R١٥-٢١,THmboembolic Phenomena,neg,R١٥-٢٢,neg,٠.٨)
INF(AND,R١٥-٢٢,Vomiting,pos,R١٥-٢٣,pos,٠.٦)

INF(AND,Tetrology of Fallot,Chest pain relief by rest,pos,R١٦-١,pos,٠.٧)
INF(AND,R١٦-١,Clubbing of Fingers,neg,R١٦-٢,neg,٠.٧)
INF(AND,R١٦-٢,Cynosis,neg,R١٦-٣,neg,٠.٩)
INF(AND,R١٦-٣,dyspnoea on extersion,pos,R١٦-٤,pos,٠.٩)
INF(AND,R١٦-٤,Generlized weakness,neg,R١٦-٥,neg,٠.٦)
INF(AND,R١٦-٥,Headach,neg,R١٦-٦,neg,٠.٦)
INF(AND,R١٦-٦,Palpitation,neg,R١٦-٧,neg,٠.٦)
INF(AND,R١٦-٧,Syncopal attack,pos,R١٦-٨,pos,٠.٩)

INF(AND,R١٦-٨,Tachy pnoea,pos,R١٦-٩,pos,٠.٩)

INF(OR,Tricuspid Stenosis,Acute chest Pain,neg,R١٧-١,neg,٠.٦)
INF(AND,R١٧-١,Asicitis,neg,R١٧-٢,neg,٠.٩)
INF(AND,R١٧-٢,blood pressure,pos,R١٧-٣,pos,٠.٩)
INF(AND,R١٧-٣,dyspnoea on extersion,neg,R١٧-٤,neg,٠.٧)
INF(AND,R١٧-٤,Generlized weakness,pos,R١٧-٥,pos,٠.٩)
INF(AND,R١٧-٥,Headach,pos,R١٧-٦,pos,٠.٦)
INF(AND,R١٧-٦,Hepatomegaly,neg,R١٧-٧,neg,٠.٧)
INF(AND,R١٧-٧,Incresed Jegular Venons Pressure(JVP),pos,R١٧-٨,pos,٠.٧)
INF(AND,R١٧-٨,Nausea,pos,R١٧-٩,pos,٠.٧)
INF(AND,R١٧-٩,Peripheral Oedema,pos,R١٧-١٠,pos,٠.٥)
INF(OR,R١٧-١٠,Pulmonory Oedema,pos,R١٧-١١,pos,٠.٦)
INF(AND,R١٧-١١,Tachy pnoea ,pos,R١٧-١٢,pos,١)
INF(AND,R١٧-١٢,THmboembolic Phenomena,pos,R١٧-١٣,pos,٠.٩)
INF(AND,R١٧-١٣,Vomiting,neg,R١٧-١٤,neg,٠.٩)

INF(AND,Unstable angina,blood pressure,pos,R١٨-١,pos,٠.٦)
INF(AND,R١٨-١,Chest pain relief by rest,neg,R١٨-٢,neg,٠.٨)
INF(AND,R١٨-٢,dyspnoea on extersion,neg,R١٨-٣,neg,٠.٧)
INF(OR,R١٨-٣,Generlized weakness,pos,R١٨-٤,pos,٠.٦)
INF(AND,R١٨-٤,Nausea,neg,R١٨-٥,neg,٠.٦)
INF(AND,R١٨-٥,Palpitation,neg,R١٨-٦,neg,٠.٨)
INF(AND,R١٨-٦,Sweating,neg,R١٨-٧,neg,٠.٦)
INF(OR,R١٨-٧,Syncopal attack,pos,R١٨-٨,pos,٠.٧)

INF(AND,Ventricular Septal defect,blood pressure,neg,R١٩-١,neg,٠.٧)
INF(AND,R١٩-١,Chest pain relief by rest,pos,R١٩-٢,pos,٠.٧)
INF(AND,R١٩-٢,Cynosis,pos,R١٩-٣,pos,٠.٨)
INF(OR,R١٩-٣,dyspnoea at rest,neg,R١٩-٤,neg,١)
INF(AND,R١٩-٤,Generlized weakness,pos,R١٩-٥,pos,٠.٨)
INF(AND,R١٩-٥,Incresed Jegular Venons Pressure(JVP),neg,R١٩-٦,neg,٠.٨)
INF(AND,R١٩-٦,Paroxysmal noctural dyspnoea,pos,R١٩-٧,pos,٠.٧)
INF(AND,R١٩-٧,Tachy pnoea ,pos,R١٩-٨,pos,٠.٦)

Certification of the Examination Committee

We chairman and members of the examination committee, certify that we have studied the thesis entitled ***(Design a Web - Based Agent Acquisition - Reasoning System)*** presented by the student ***Hayfa'a Talib Hussein*** and examined her in its content and in what is related to it, and we have found it worthy to accepted for the degree of Master of science in Computer science with ( ) degree.

Signature:

Name : **Dr. Salah A. Al-Bermany**

Title : **Lecturer**

Date : **/ /** ٢٠٠٧

(Chairman)

Signature:

Name : **Dr. Tawfiq A. Abbas**

Title : **Assistant Professor**

Date : **/ /** ٢٠٠٧

(Member)

Signature:

Name : **Dr.Saad T. Hassoon**

Title : **Lecturer**

Date : **/ /** ٢٠٠٧

(Member)

Signature:

Name : **Dr. Nabeel H. Kaghad**

Title : **Professor**

Date : **/ /** ٢٠٠٧

(Supervisor)

Signature:

Name : **Dr. Abbas M. Al-Bakry**

Title : **Assistant Professor**

Date : **/ /** ٢٠٠٧

(Supervisor)

Signature:

Name : **Dr. Oda Mizi'l Yasser Alzamely**

Title : **Professor**

Date : **/ /** ٢٠٠٧

(Dean of College of Science – Babylon University)

Chapter One

Overview

١.١ Introduction

The amount of information available about the World Wide Web is increasing on a daily basis. General purpose search engines and browsers provide valuable assistance to users in locating general information relevant to their needs.[١]

The key to the knowledge agent (KAg) approach is that it specializes in a domain by extracting relevant information every time it performs a search and uses this knowledge to improve the precision of subsequent search efforts. To this end, the KAg maintains a knowledge base (KB) that stores this information persistently. The KB consists of a set of leading sites in its domain and a repository of frequent terms in these sites. Each term is associated with a list of lexical affinities closely related terms frequently found in its proximity [٢].

The KB is adapted continuously by the agent during search. New highly relevant pages found by the agent are entered into the KB, possibly taking the place of old pages with lower utility. The KB can be initialized by providing a set of sites relevant to the domain of interest. [٣]

The area of Intelligent Agents has emerged in recent times as a hot topic in several branches of computing research from artificial intelligence to information systems [٤].

Agent offers new ways of abstraction, decomposition and organization that fit well with our natural view of the world and agent oriented programming is often considered a natural successor to object oriented programming [٥].

An intelligent agent is one which is able to make rational decisions, i.e., blending proactive ness, showing rational commitment to decisions made, exhibiting flexibility in the face of an uncertain and changing environment [٦].

The amount of experts connected via the networking is increasing daily .Thus the need for their advice in a remotely place becomes great. The intelligent tool that can acquire a suitable knowledge base file from its resources (domain expert's location) and transmit it to the serving site .The expert system can handle knowledge acquired by the knowledge agent and generate new expert systems according to the knowledge acquired.

In this study, an automated system is designed in the first step, the system helps the domain expert by applying a structured approach to the acquisition and management of the knowledge through agency system as well as a reasoning by diagnosis diseases. The proposed system involve two basic requirements. First the need to decompose the knowledge acquisition task itself into manageable sub tasks by using intelligent agents. Second, fuzzy is used for converting some data from quantity to digitize to proper it as input to the multilayer feed forward neural network which is used for reasoning, the need to focus on a representation of expertise that is natural to domain experts so that they can think about their expertise rather than how to represent it in a computer. In the second step the system generates developed system in different diagnosis fields .Which used ANN to serve different people in different domain thought a serving server without any effort.

١.٢ Literatures Survey

Literature can be found to match directly or indirectly the exact research area, i.e. the collection of using Agent to acquiring knowledge formats resources as can be found in the following:

- Christopher G. Marks, in March,١٩٩٩ **[٧]** presented **"*Extensible Multi-Agent System for Heterogeneous Database Association Rule Mining and Unification*"** , MSc. thesis, This thesis proposes and describes a methodology and a tool for mining association rules from multiple heterogeneous data sources and then unifying the results for future incorporation into a knowledge base.

  This system will use an existing agent development tool to establish a multi-agent based framework and define the communications between those agents. The framework will accept a request for one of three possible data mining operations. Once the system accepts the request, it will determine which data sources can fulfill the request and tasks the agents responsible for those sources to begin data mining. Once results have been obtained, they will be unified to eliminate redundant or conflicting results. The framework will be designed to accept a request from *Probabilities, Experts System, Knowledge, and Inference* PESKI for one of three possible data mining operations.

There are two expected products from this research. ***First,*** this research details the thought process and design decisions that were made in designing and making an extensible multi-agent system that allows data mining and unification of association rules. The ***second*** product is the Java source code that implements the framework and provides reusable methods for extending the system. It includes all the agents' implementation code and conversation classes for directed communications as well.

- Li, L. and Chakravarthy S, in ١٩٩٩ **[٨]** presented "***An Agent-Based Approach to Extending the Native Active Capability of Relational Database Systems*** ". The authors extended the active capacity of a relational DBMS with an approach based on agents. The extension was done by the incorporation of a mediator between the DBMS and its users. The agent is responsible for rule creation, event notification and action firing. This is possible because the agent provides a user interface where E-C-A (Event-Condition-Action) rules may be created, as well as events. Event-condition-action (or ECA) rules were used to capture active capability.

  This research addresses the problem of turning a traditional database management system into a full-fledged active database system without changing the underlying system. And describes how complete active database semantics can be supported on an existing SQL Server by adding a mediator, termed ECA Agent, between the SQL Server and the clients. ECA Agent is designed to connect to SQL Server by using Sybase connectivity products.

- Yolanda G. and Marcelo Tallis., ٢٠٠٠ [٩] presented "***A script –Based Approach to Modifying Knowledge Base*** ". And built a knowledge acquisition tools that supports users in modifying knowledge based system. These modifications may require several individual changes to various components of the knowledge base which needs to be carefully coordinated to prevent users from leaving the knowledge based system in unstable state.

- Gorodetski V. ***et al*** ., ٢٠٠١ [١٠] presented " ***Agent –Based Model of Computer Network Security System".*** They considered multi-agent model as a computer networks security system which is composed of particular autonomous knowledge based agents, distributed over the hosts of the computer network to be protected and cooperated to make integrated consistent decisions. This work focused on an architecture, implementation and simulation of a case study aiming at exploration decisions and potential advantages of using such architecture for the computer network protection .

- Christopher S.G. Khoo, Syin and Yun Niu .,٢٠٠١ [١١] presented **"*Extracting Casual Knowledge From Medical Database Using Graphical Patterns****".*** They developed knowledge extraction and knowledge discovery system that extracts causal knowledge from textual databases. In this initial study, they developed a method to identify and extract cause-effect information that is explicitly expressed in medical abstracts in the Medline database. A set of graphical patterns were constructed that indicate the presence of a causal relation in sentences, and which part of the sentence represents the cause and which part represents the effect. The patterns are matched with the syntactic parse trees of sentences, and the parts of the parse tree that match with the slots in the patterns were extracted as the cause and the effect.

- Abbas M. Al-Bakry.,in ٢٠٠٣ [١٢] presented "***Expert System Development Using Knowledge Agent (ESDKA)".*** PhD. thesis, to obtain an updated knowledge in different diagnosis domains in order to create an intelligent system can help people to solve their problems. This needs a suitable way for acquiring this knowledge from the trustworthy sources .So an automated way from knowledge acquisition from its genuine resources way which can themselves will be created, then employing this

knowledge in a suitable way which can be used by many people, this is done through a serving site in a communication.

- Rogerio L., Sergio L.,Marcos A., in ٢٠٠٤ **[١٣]** presented *"**Index Self-tuning with Agent-based Databases***".** This research proposed the use of software agents to deal with self-tuning and DBMS's operational requirements. This system proposed an index self-tuning complete process with automatic creation of indexes in agent-based database architecture. And showed revised heuristics for an index selection agent's decision process and discussing an object-oriented design for the implementation of this agent in a real DBMS.

  This system uses an approach that matches agents systems and DBMS's in a feasible architecture. The agent architecture chosen is based on an object-oriented framework for building agent systems, which identifies each agent function and can be used for both simple and complex agents.Each layer communicates only with the layers that are located above and below it, with exception of the Mobility and Sensory layers that communicate with other agents/environment regions to execute their functions.

- Muhannad M.Al-Yasiry.,in ٢٠٠٥ [١٤] presented " ***Design & Implementation of Databases Integration Agent ".*** The design and implement of database integration agent system tried to present a structured approach to accomplish the integration between two separate databases. The proposed system consists of four main parts, these are: pre-integration, automatic schema matching, resolving conflicts, and merging part.

  The databases Integration Agent approach present in this work suggested a new paradigm, which replace the role of human in some place of databases

integration process. Also the proposed system demonstrated an important role in the resolving conflicts when applied on a number of databases, which depended on specific knowledge for improving its results. Finally, the proposed system reduces cost, eliminates errors, and shortens development time by using the Agent–Oriented Software Engineering which presents advance High-Level Methodologies like Gaia Methodology.

- Mariam S. Al-Abraheemee.,in ٢٠٠٥ [١٥] presented " ***Interface Agent For Database System*** **".** In this work , one type agent was used , which was an interface agent and she have tried to implement its environment which is a local database and show the role of the interface agent in this environment.

  The interface agent was used as personal assistant for the user when he interacts with the applications; it explains the applications by displaying some massage on the screen about the validity of the entering data and explains which to do in the next step. It interacts and helps the user along his dealing with the database.

١.٣ Thesis Objectives

The aim of this thesis is to design and implement a web - based agent acquisition – reasoning system. This is done by designing a formal format to domain expert shared through a web wide world. This format can be filled by domain expert after authorized checking. Automatic conclusion can be generated after end-user filled the answers of the questions .This is done through the reasoning subsystem using fuzzy and neural network.

١.٤ Thesis Layout

The reminder of this thesis is organized as follows:

- Chapter Two: ***The Fundamentals of The Related Topics:***
  This chapter gives us brief information about knowledge base acquisition process and the roles extraction methodologies: knowledge base, the intelligent Agent, Knowledge Acquisition, Fuzzy Logic And Neural Network, can be employed in a Based Agent Acquisition – Reasoning process.

- Chapter Three: ***Web-Based Fuzzy Reasoning System:***
  This chapter (a practical chapter) shows how we can use Agency system methodologies to build an easy model uses that knowledge base. It explains

the structure of the proposed system by making Acquisition – Reasoning by using fuzzy and neural- in high cooperative way.

- Chapter Four: ***Implementation, Conclusion, And Future Work:***

  This chapter Introduces implementation process of the proposed system, case study of the proposed system in addition to the conclusions, the discussion and the suggestions for future work .