Fuzzy Rule-Base Expert System Assessment Possibility Of Allergy

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Abstract-*The allergy based diagnostic expert organization (ABExS) is designed to help or assistance the psychological science doc to diagnosing the various mental upset related to human being. ABExS can be used to perform some rating of affected role's physical and emotional symptom to diagnose the particular upset In this expert allergy system there are of different case of method acting to find out about the various character of allergies. But in this will combine various diagnosis of allergy in unity system of rules. So patients have no need to go to different PR auctioneers/doctors for diagnosis. A single system will be responsible for curing all eccentric of allergies. The Diagnosis system uses more identification number of variable than previous diagnosis to give more accurate results than the previous one. As a result, the decision support system will be more closely between machine and humans. ABExS using three AI proficiency: Fuzzy generator, Fuzzy system of logic and normal based reasoning. We are going to describe a new method for creating a weighted fuzzy convention to deal with the ment5al illness. The fuzzy rule is a causal rule. Its IF part truly cause the THEN. The knowledge of human expert system in the surface area of mental ill and disorder is transformed and often encoded into the knowledgebase using a fuzzy logic and then provide the rigor of any particular disorder.*
Keyword - *expert system, fuzzy logic, diagnosis, medical record and Decision support system.*

I.   Introduction

Research has shown that when medical skilled lead the problem of diagnosing sickness, based on limited opinion provided in the consultation they speedily generate a small number of disease hypotheses, and then, they follow to confirm or falsify these hypotheses with further specific examination and testing". For helping the checkup examination diagnosing system for Human disease diagnosing, to building a knowledgebase environment is a complicated job because the particular importance of all the entropy of medical. One another is reason is that the interpretations that are given by different doctors to the patients

Systematic Approaches to Medical Surgical: Systematic approach is the way of thinking and   acting based on the scientific method. It is problem solving technique. It provide the framework for
1. Identification of patient assets, limitation
2. Determine the goal and actions
3. Implementation of action
4. Evaluation of effective conclusion.

It provides the mean for monitoring quality care provided. The patient, families provide the input as much as possible to identify the strength and weakness of health, and setting the possible goal. The systematic approach has three phases. The major steps are assessment, intervention, and evaluation.
1. Assessment: The assessment process consists of collection of data. It also considers the analysis of data to determine the nature of the patient's problems. All the preliminary information related to human health is gathered need of persons being assessed. The five major basic categories are, self actualization, love, belonging, physiologic (needs oxygen, sleep and rest), safety. After data is obtained from primary sources, they arranged in such a manner that conclusion has reached.
2. Intervention: When various problems have been identified, we must determine the priority to the problem.
3. Evaluation: The last step consist of whether the desire outcome met or not. Analyzing the effectiveness of intervention. The following conclusion can be drawn :
1. The goal was met; no further action is needed for the started problem.
2. The goal was partially met, continued performing action.
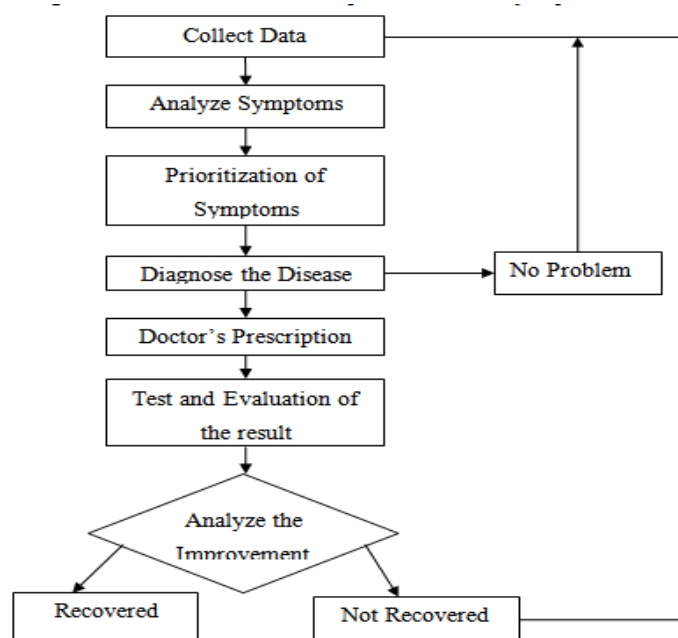3. The goal was not met; there are several possibilities that may be present.

Figure1. Component of manual diagnosing process

Related Work

The allergy diagnosis system process is classified into following categories

1. **Collection of Symptoms Data**: The most important information about the patient's medical record present in the hospitals and the symptoms that are present is gathered by the medical experts or physician. This information considered as the 'subjective information'. This information is further helpful for diagnosis of particular disease.

2. **Interaction with Expert:** The next step is to interaction with the expert or specialist**.** The expert deal with the daily problems related with disorder of human body parts. It will tell you the more details of the common diseases which found in our daily life.

3. **Categorization of Diseases and Symptoms**: Afterward interacting with the proficient, ABMxS creates the list of diagnosis that represents the sign and symptom of patient. This phase show the classification of the sign and symptoms. Due to the presence of one symptom the disease can change. Giving help the medical diagnosing system for Human disease diagnosing, to preparing a knowledgebase environment is a complex work due to the specific importance of whole data of medical.

4. **Rule Formulation:** Fuzzy rules of the sign and symptom and the diseases are implemented here. In this phase we produced weighted fuzzy set rule to perform with the medical diagnosing matters from the training data. It is a causative rule (In which IF part truly causes the THEN part to happen **as** an issue) based medical diagnosis expert system. The entire symptom is evaluated to make sure the correct symptom for the correct disease. Rule base is designed for the human disease using the symptom that is added to the database is correct.

5. **Expert Review of Rule Base:** In this phase, we examined the rule viewer of the rule base. It gives to the result. On the basis of these symptoms particular disease is examined and suggests the patient to a particular specialist. The disease is evaluated on the basis of knowledge of expert.

6. **Finalization of Rule Base:** In this phase the final result is examined on the basis of the sign and symptom.

7. **Designing of User Interface for Interaction:** The last phase of the development process is to designing of graphical user interface. This Graphic user interface will help to the user to deal with this expert to find the particular disease. This system the symptoms are input and a disease is output. After finding the disease it suggests the specialist for the treatment. The medical diagnosis system is designed using the MATLAB R2013a. The overall database is designed using the fuzzy logic. Mainly the system has following module.

Research Objectives

* To compute the computer statics in real world problems of allergy and promote the concept of developing a medical specialty in allergy diagnosis.
* To assist doctors for various diseases associated with various type allergies i.e. to be a home assistant for doctors.

- To develop a tool in the form of database to assist those searching for allergy diagnosis which will use fuzzy Rule Based expert methods in the form of guidance a patient to find out the allergy disorder effectively.
- To analyze various measuring parameters with accuracy, reliability & dependency of the system.
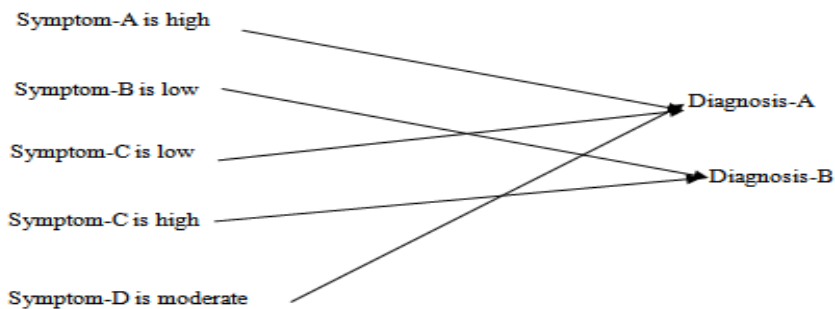
Research Methodology
We can diagnosis the results from the experience or observation and the sign and symptoms of the patient. If we examine the procedure which is followed by the physicians to identifying the disease, that is the simpler method. Some symptoms are occurring at a high range or other are occur at low or moderate range. Example in figure2 illustrate the how to diagnosis the disease
Diagnosis-A - (symptom-A is high **&** symptom-C is low & symptom-D is moderate)
Diagnosis B - (symptom-B is low & symptom-C is high).

Fig 2 Disease diagnosis

4.3.1 Identification of parameters: This is the most important part to take into the consideration. The symptoms play the significant role in cause of the disease. In this paper we find the different diseases that are associated with symptoms of each specialist.
4.3.2 Choice of membership function: The ability of system is calculate by the selection of membership function that is used for each input and output parameters. There are number of symptoms that do not have a specific values and the membership function are selected for each of the parameter that is used. These membership values are taken on the basis of acquisition method. Likewise the number of membership function used there are several more factors need to be take consideration and these factors are the conjunction, disjunction, aggregation, kind of parameters and the range of the parameters. The properties of every fuzzy variable are represented using triangular and trapezoidal (for the input variables such as symptoms) and the triangular (for the Outputs). In this paper, the fuzzy set represented by a number of membership function.
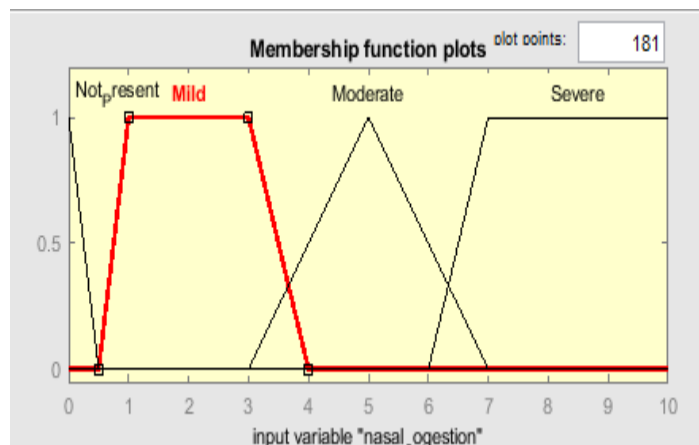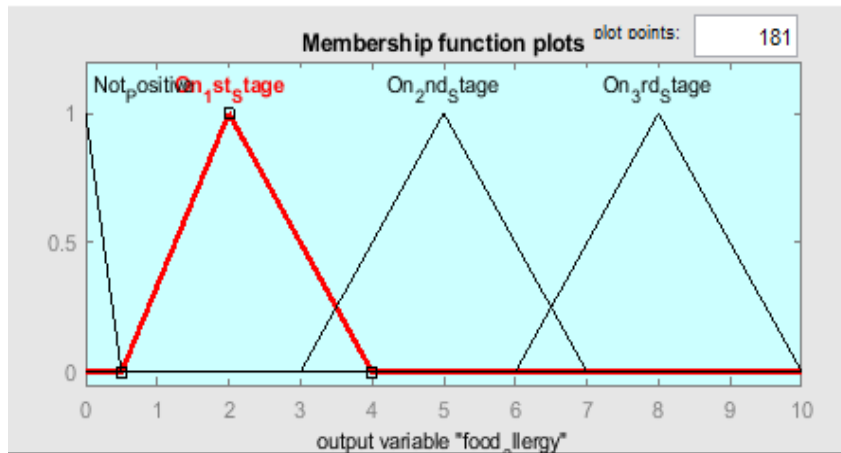

Fig3. Membership function for input

Fig4. Membership function for output

Algorithm

1. Inputs: - symptoms.
2. Output: - Diagnose the particular Disease with the stage of disease and suggest the specialist
3. Input variable allot with fuzzy variable. And has the membership function.
4. Rules are prepared on the basis of the membership function.
5. Concluded disease is verified on the basis of the weight age of input variable.
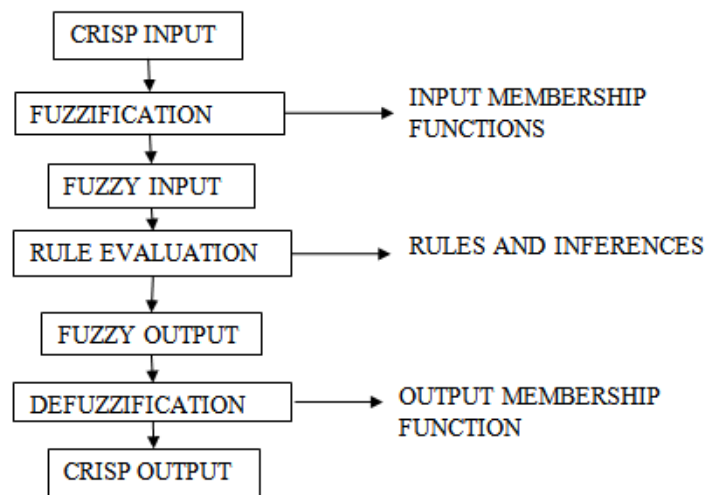
Flow Of Algorithm For Present Work

Experimental Results

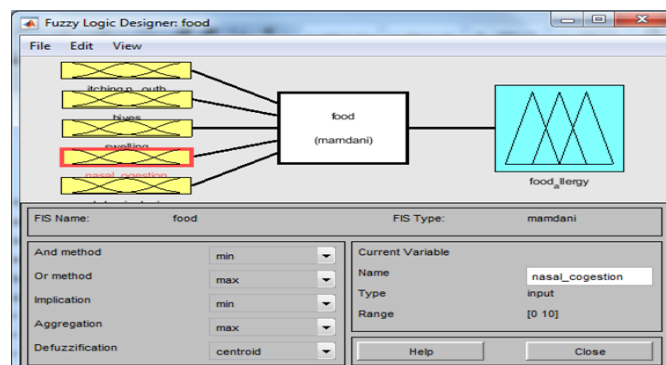**Fig5. Flow of algorithm of Present work**

Fig6. FIS of food allergy

Type='mamdani'
Version=2.0
Number of Inputs=5
Number of Outputs=1
Number of rules Rules = 1024
For each input variables

➢ Range=[0 10]
➢ Number of MFs=4
➢ MF1='mIld':'trapmf',[0.5 1 3 4]
➢ MF2='Moderate':'trimf',[3 5 7]
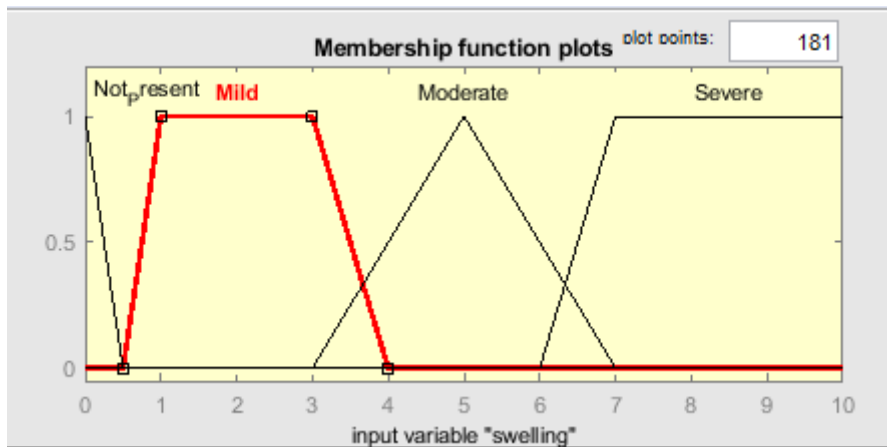➢ MF3='Severe':'trapmf',[6 7 10 10]
➢ MF4='Not_Present':'trimf',[0 0 0.5]
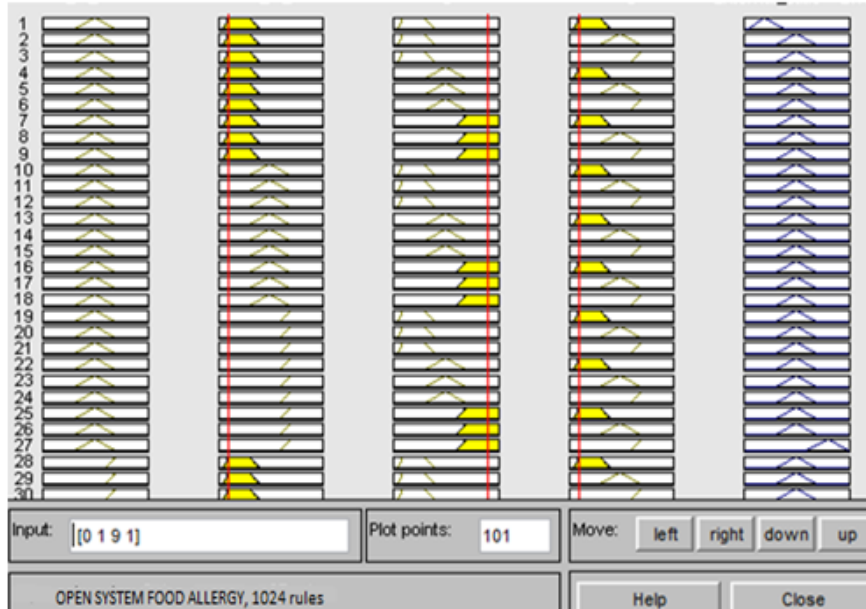

Fig 7.MF of Swelling

Fig 8.Rule Viewer of Tingling in Mouth

Design of GUI

GUI (Graphical client interface): the most recent stage of the improvement methodology may be with outlining from claiming graphical client interface. This GUI will assistance of the client should connect with this master with Figure those specific illnesses. This framework takes those manifestations similarly as information what's more provides for the yield Likewise an infection. After finding those yields it recommends the master for the medication. The therapeutic analysis framework will be planned utilizing that MATLAB R2013a. Those general databases may be planned utilizing those fluffy rationales. Mostly those frameworks need emulating module.

➢ Learning Base: the fundamental indications of patients are included with this framework. Weights would dole out on unique manifestation that is saved under those tenet base and the side effects need aid fuzzified.

➢ GUI Interface: this module gives the graphical client interface that indicates the tolerant majority of the data and gives the fundamental sign Furthermore indications that might happen. This framework gives those associations between the client and the master framework.

➢ Induction Engine: in this module the place the defuzzification of the framework is carried.

II. Conclusion

This system can be used by the doctors, physician in our daily life. The proposed medical Diagnosis expert system, one can allow the physician to follow the same process to diagnose the diseases and he/she will able to suggest the specialist in easy way. A lot of research has been done in medical field but more research increase the accuracy of the system. So many properties of this system remain to investigate. Future application for the database should be good. Now a day's most of the modern hospitals use the computer based records than paper based. Now it would be more easily to acquisition the data from records for the machine diagnosis. An expert should evaluate the quality performance of this system.

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