IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

Enhancement In Data Mining Using Fuzzy Associative Rule-Based Strategy

Kiran Kumari* Mr. Saroj Kumar Gupta**

*(Student of Master of Technology in Computer Science & Engineering, Rao Pahlad Singh College of Engineering & Technology, Balana(Mahendergarh)

**(Assistant Professor in Department of Computer Science & Engineering, Rao Pahlad Singh College of Engineering & Technology, Balana (Mahendragarh)

Abstract:

The latest new approach for data mining implementation of Associative Rule Mining with Fuzzy Logic. The Combination is announced through Fuzzy Associative Rule Mining (Fuzzy ARM). This helps in decision-making for the given Complex problems. Associative Rule mining is one of the widely used technique for data mining.

In this research paper, Fuzzy approach used with Associative rule mining technique which increase the power of Decision making. Using Fuzzy logic predictions are made more reliable than conventional methods. Improved Associative Rule based Fuzzy Algorithm to predict the risk involved in identifying disease which is through fuzzy based C-Means clustering concept adopted to discover inference knowledge from frequent patterns.[1]

Keywords — Fuzzy Logic, Data Mining, Association Rule Mining.

I. INTRODUCTION

Data mining is an approach to extract data with efficient and reliable way from huge amount of data in database. It become difficult to analyze pattrens for extract if volume is high. The mining means sortingthe large dataset to identify the patterns and relationships in it. It can also help in problem-solving in the data analysis process. There are four stages in data mining. They are data sources, data exploration, Modeling, and deploying models. This technique is used in many fields such as mathematics, cybernetics, genetics, education, sports, medicine, marketing, etc.; web mining is a type of data mining used in customer relationship management. It also consist of parameters like association rule mining, sequence or path analysis, classification, clustering, and data forecasting.[2]

Fuzzy logic in data mining involves computation of data based on predictive models and its categories. In the traditional method this was done with "TRUE" or "FALSE". Algorithms using Fuzzy logic have increased the power of decision making.[3]

II. WHAT IS ASSOCIATIVE RULE MINING?

Association Rule Mining :

Definition 1: Let PT be a set of patients, which contains different patients PT1, PT2, PT3,…….PTn which may occur in different transactions, ***PT= {PT1, PT2, PT3,…….PTn*** }.

Definition 2: Let ST sets of symptoms contains different symptoms ***ST1, ST2, ST3…....STm: ST= {ST1, ST2, ST3…....STm}*** where ST $\subseteq$ PT in transactional data base DB.

Definition 3: An association rule represented in the form of an implication of $ST1 \rightarrow ST2$ *where* $ST1, ST2 \subset ST, ST1 \cap S2T = \phi$, ST1 is called the antecedent and ST2 is called consequent. Support (ST) of an association rule is defined as the percentage of records that contain the total number of records in the database.[4]

$$Support, ST(ST1 \rightarrow ST2) = Supp(ST1 \cup ST2)$$

III. INFERENCE RULE MINING

The inference engine is a software tool that deduces new knowledge or fact by using domain fact knowledge to discover inference knowledge. Basically, it is one of the logic unit in the expert system.[5] It uses general rules of inference to reason from the knowledge base and draw conclusion which are not explicitly stated but can be inferred from the knowledge base. Let ***S*** be the set of symptoms contains different symptoms ***S1, S2, S3, S4, S5….,*** Sn and DIS is the set of disease ***D1, D2, D3, D4***. Suppose that we have following rules:

R1: IF S = (S1, S3, S5) Then DIS=D1
R2: IF S = (S2, S4, S5) Then DIS=D2
R3: IF S = (S1, S2, S5) Then DIS=D3
R4: IF S = (S3, S5) Then DIS=D4

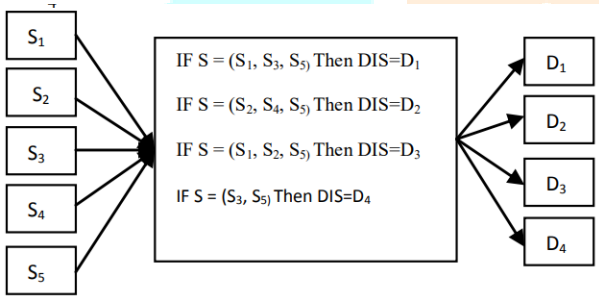

Fig 1.1 Inference System

IV. C- MEANS FUZZY LOGIC

The fuzzy *c*-means algorithm is exactly similar to the *k*-means algorithm:

1. There need to Choose a number of clusters.
2. Assign coefficients randomly to each data point for being in the clusters.
3. Repeat until the algorithm has converged.
   - Compute the centroid for each cluster (shown below).
   - For each data point, compute its coefficients of being in the clusters.[6]

V. PROPOSED WORK

In this paper, proposed an approach which helps in prediction of diseases symptoms through fuzzy associative rule mining.[7] It follows four phase procedure to achieve required inference from trainee dataset and the phases are as follows:

1. **Data Collection** – Required data needs to collect (Collect data of all suffering people). All Symptoms of disease needs to store into an excel file.
2. **Fuzzy Inference System** – Needs to consider four parts here - rule base, fuzzification, inference engine, and defuzzification. [8]

In rule base, decision will make based in the IF-THEN conditions. At the same time, in the fuzzification, the crisp input, which is temperature, pressure, etc., the Inference engine will trigger the condition by matching the input with rules. Defuzzification converts the rule into crisp input. There are three types of fuzzifier includes singleton, Gaussian, trapezoidal or triangular fuzzifier.[9]

3. **Prediction -** Using the fuzzy association rule mining, predicting the disease through the generation of the rules using a rule generator and predicting the possibility of the disease.[10]

Dengue Diagnostic tool GUI

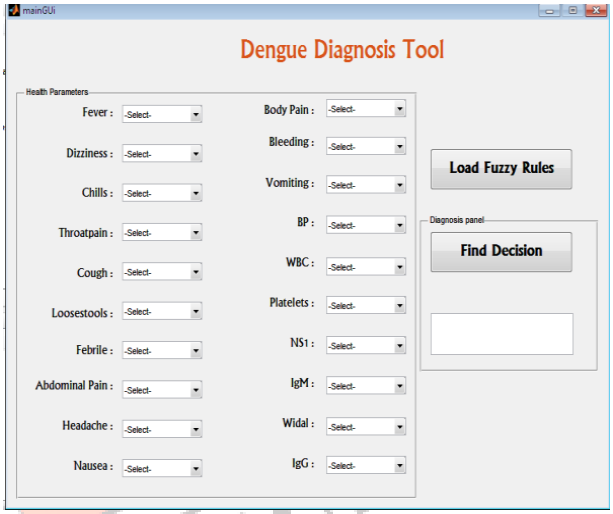

Fig 1. Graphical view of Diagnostic tool

Disease Prediction Rule Generator

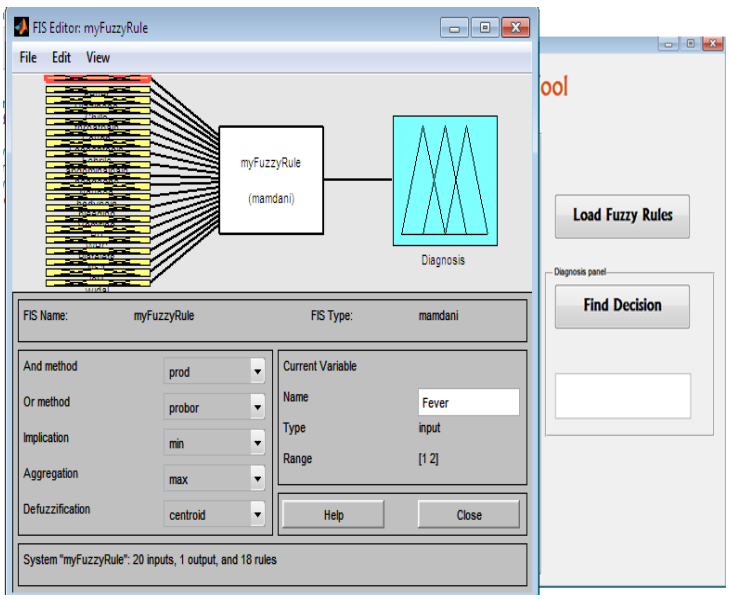

Fig. 2 Inference Engine

Diagnosis of Disease:

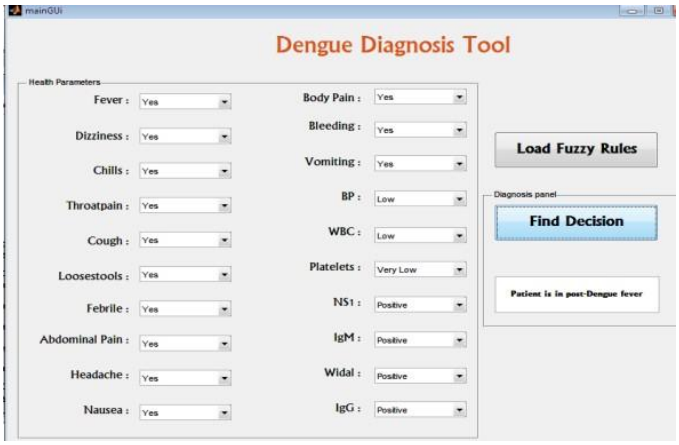

Fig. 3 Fuzzy logic for prediction

VI. FUTURE SCOPE

This system will make the process easy to understand the exact disease according to symptoms which patient have. Prediction changes are high here and accurate to caught it. It is fast processing as well and result will be fast. It can be used in future for other dangerous diseases as well.

VII. CONCLUSIONS

From the proposed system, it has been concluded that the fuzzy association rule mining technique with the rule generation will provide the possibility of disease prediction was performed. In thefuture, it has been improved with more latest techniques.

ACKNOWLEDGMENT

It is a matter of great pleasure for me to submit this report on the Research Paper entitled **"Enhancement in Data Mining using Fuzzy Associative Rule-Based Strategy"**, as a part of curriculum for the award of "Master of Technology" in Computer Science & Engineering, Rao Pahlad Singh College of Engineering & Technology, Balana (Mahendragarh).

I would like to express my sincere gratitude to the faculty of Computer Science & Engineering Department, Rao Pahlad Singh College of Engineering & Technology, Balana (Mahendragarh) for the constant encouragement, expert advice, guidance, devotion and timely suggestions which helped me at every stage of this work. I would also like to thank to all my family members and friends who have helped me in one way or another.

Author's Contributions

All authors equally contributed in this work.

REFERENCES

[1] R. Srikant, and R. Agrawal, "Mining Quantitative Association Rules in Large Relational Tables," in Proc. of the ACM SIGMOD Int'l Conf. on Management of Data, Monreal, Canada, June 1996, pp. 1-12.

[2] N.A Husin,A Alharogi,N.Mustapha, H.Hamdan, U.A Husin "Early self-diagnosis of dengue symptoms using fuzzy and data mining approach", AIP Conference 2016 Sep, 2018.

[3] N.Iqbal,M.Islam"Machine learning for dengue outbreak prediction :An Outlook"IJACS,vol .8,no. 1,Jan-Feb. 2017,pp. 93-102

[4] K.Chaturvedi, R.Patel, D.K Swami"A Fuzzy Inference approach for association rule

[5] Odii J.N,Onwuama T.U,Okpalla C.L,Ejem A,"Job scheduling system using fuzzy logic approach"IJCTT,vol.42.no.2,Dec 2016. mining"IOSR,vol.16,Issue.6,Nov-Dec.2014,pp.57-66.

[6]Fuzzy clustering
Fuzzy clustering - Wikipedia

[7]
http://www.who.int/denguecontrol/monitoring/en/

[8]
https://searchsqlserver.techtarget.com/efinition/data-mining

[9] M.V.J Reddy, B.Kavitha "Expert system to predict the type of fever using data mining techniques on medical databases"IJCSE, vol.3, Issue.09, Sep. 2015