

## Fuzzy decision tree optimization by genetic algorithm for Mizaj (Temperament) detection in Traditional Persian Medicine

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### Abstract:

**Background and Purpose:** One of the most important topics in Persian Medicine is the knowledge of temperament identification and many of the instructions for preserving health, diagnosis and treatment of diseases are different based on the individual's temperament. Discovering and recognizing standard methods of temperament determination, is one of the most important research priorities in Persian Medicine. In this research, fuzzy decision tree for data classification and Genetic Algorithm (GA) to optimize the features necessary for the diagnosis of temperament is used.

**Materials and Methods:** In this study, two datasets with 52 and 221 samples were used. For datasets, data recognition and modeling Mizaj (Temperament) diagnosis based on fuzzy decision tree with GA was performed. To do this, first, a subset of features was selected using GA and then a fuzzy decision tree was used to make the rules.

**Results:** For each dataset, two decision trees were generated for warmth/cold and wet/dry and the produced rules by the Persian Medicine specialist were evaluated. The results showed that the produced correct rules in the second dataset are 44% for warm/cold Mizaj and 33% for wet/dry Mizaj. In the first dataset, the generated correct rules by the fuzzy decision tree with the GA for wet/dry Mizaj was 9.5%.

**Conclusion:** Comparison of the results with the previous research shows that the use of GA and subset selection of features, reduces the computational volume, size of the tree and error percentage so that better results can be achieved. Although, according to Persian Medicine experts' opinion, the results of this research are not currently applicable, they can be a starting point for further researches in the optimization of intelligent swarm algorithms for the diagnosis of Mizaj.

**Keywords:** Mizaj, Temperament, Persian Medicine, Decision Tree, Fuzzy Logic, Optimization

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