Comparative Analysis of Fuzzy Expert Systems for Diabetic Diagnosis

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Abstract

Diabetes is a situation when a body is not capable to produce insulin, which is needed to control glucose. Diabetes will also develop heart disease, kidney disease, blindness, nerve damage, and blood vessel damage. This paper uses Mamdani-type and Sugeno-type fuzzy expert systems for a diabetes diagnosis. Fuzzy expert system is a group of membership functions and rules. Fuzzy expert systems are tilting toward numerical processing. This paper recapitulates the essential distinction between the Mamdani-type and Sugeno-type fuzzy expert systems by using the input parameters such as age, obesity, RBS(Random Blood Sugar), family history and diet. The MATLAB fuzzy logic toolbox is used for the imitation of both the models. The accuracy, sensitivity, specificity and precision of the Mamdani-type fuzzy expert system is 95.48%, 96.36%, 93.33% and 97.24%, respectively, and the accuracy, sensitivity, specificity and precision of the Sugeno-type fuzzy inference system is 96.77%, 97.27%, 95.55% and 98.16%, respectively.

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Index Terms

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Keywords

Diabetes; Mamdani; Sugeno, disease