# Fuzzy thinking could spot heart disease risk

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A new approach to evaluating a person's risk of cardiovascular disease, stroke, high blood pressure, or heart failure is reported this month in the *International Journal of Data Mining, Modelling and Management*. The technique uses fuzzy logic to teach a neural network computer program to analyze patient data and spot correlations that can be translated into a risk factor for an individual.

Khanna Nehemiah of the Anna University Chennai, India, and colleagues have developed a medical diagnostic system for predicting the severity of cardiovascular disease based on combining the fuzzy logic, neural networks and genetic algorithms. The resulting statistical model improves on previous attempts and is accurate 9 times in 10 in determining patient risk.

Cardiovascular disease (CVD) refers to disorders of the heart or blood vessels and includes coronary heart disease, cerebrovascular disease, raised blood pressure, peripheral artery disease, rheumatic heart disease, congenital heart disease and heart failure. The World Health Organization in 2009 estimated that almost 20 million deaths occur annually from cardiovascular disease and that by 2030 that figure could rise to almost 24 million.

"In order to reduce the rate of morbidity and mortality due to CVD, it is essential to diagnose early and administer appropriate treatment," explains Nehemiah, who points out how clinical diagnosis has always been supported by data analysis combined with medical expertise.

He and his colleagues hope that their new approach to analyzing patient risk will help reduce the time taken by medical experts to make a diagnosis. "A clinical-decision support system should consider issues like representation of medical knowledge, decision making in the presence of uncertainty and imprecision, choice and adaptation of a suitable model," they explain, all points that their new model addresses.

The team concludes that their fuzzy neural network approach could be improved still further by tweaking the architecture of the network and by extracting generic rules from the system that could be used to obtain a more precise risk factor.

  **More information:** "Fuzzy neuro genetic approach for predicting the risk of cardiovascular diseases" in *Int. J. Data Mining, Modelling and Management*, 2010, 2, 388-402

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