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Analysis of Fuzzy Decision Trees on Expert Fuzzified Heart Failure Data

By: Bohacik, J (Bohacik, Jan)^[1,3,4]; Kambhampati, C (Kambhampati, C.)^[1]; Davis, DN (Davis, Darryl N.)^[1]; Cleland, JFG (Cleland, J. F. G.)^[2]

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Abstract

The prevalence of heart failure is 2-3% of the adult population and it is expected to grow. Half of all patients diagnosed with it die within four years. To minimize life-threatening situations and to minimize costs, it is interesting to predict mortality rates for a patient with heart failure. In this paper, a fuzzy decision tree based on classification ambiguity and a fuzzy decision tree based on cumulative information estimations are presented. They are employed on a heart failure data fuzzified on the basis of medical expert knowledge. After a transformation of fuzzy decision trees, the use of medical expert knowledge allows us to create a group of fuzzy rules that is easily interpretable by medical experts. Our study shows that different types of fuzzy decision trees can have significantly different accuracy results and interpretability.

Keywords

Author Keywords: fuzzy decision tree; fuzzy rules; fuzzification; cardiology; heart failure

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Author Information

Reprint Address: Bohacik, J (reprint author)

- Univ Hull, Dept Comp Sci, Kingston Upon Hull HU6 7RX, N Humberside, England.
Organization-Enhanced Name(s)
University of Hull

Addresses:

- [1] Univ Hull, Dept Comp Sci, Kingston Upon Hull HU6 7RX, N Humberside, England
Organization-Enhanced Name(s)
University of Hull
- [2] Univ Hull, Dept Cardiol, Kingston Upon Hull HU6 7RX, N Humberside, England
Organization-Enhanced Name(s)
University of Hull
- [3] Univ Zilina, Dept Comp Sci, Zilina, Slovakia
Organization-Enhanced Name(s)
University of Zilina
- [4] Univ Zilina, Dept Informat, Zilina, Slovakia
Organization-Enhanced Name(s)
University of Zilina

E-mail Addresses: J.Bohacik@hull.ac.uk; C.Kambhampati@hull.ac.uk; D.N.Davis@hull.ac.uk;

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J.G.Cleland@hull.ac.uk

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