Data Mining, Computational Intelligence, and Software Testing

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Abstract

Most business decisions are made in the absence of complete information about the decision consequences. Since deferring the decision due to the lack of sufficient information may not be an option, a decision maker can use data mining algorithms for discovering valuable patterns in the sea of digital data. The knowledge discovery in databases is a process of *approximate reasoning*, since it is concerned with inferring imprecise conclusions from imprecise (noisy) real-world data. Computational intelligence can play an important role in the process of knowledge discovery, especially as an efficient tool for representing the trade-off between classification performance and comprehensibility of data mining models. Computational intelligence methods in data mining include neuro-fuzzy and info-fuzzy networks, fuzzy decision trees, information granularity, automated perceptions, and many others. Data mining techniques, which are aimed at inducing the best model from a given set of data, are closely related to the problem of generating efficient test cases for a given computer system. This provides a great potential for automating a very expensive process of software testing by using the methods of computational intelligence and data mining.