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Topic of Research:	An Investigation into MCDM Algorithms for the Selection of Software's Requirements

Ph.D. Research Findings

Software requirements (SRs) selection methods are employed to select the SRs from the list of the elicited SRs according to the need of the stakeholders so that a successful software product can be developed. Different methods have been proposed in the area of SRs based on multicriteria decision making (MCDM) and search-based software engineering techniques. This thesis attempts to present the different methodologies for SRs selection with the help of the following MCDM algorithms, i.e., "*analytic hierarchy process*" (AHP) and "*technique for order of preference by similarity to ideal solutions*" (TOPSIS).

The first methodology is based on AHP in which we have generated different patterns and sub-patterns of the "*pairwise comparison matrices*" (PCM) after the evaluation of the SRs based on the functional and non-functional requirements. In this methodology, a database was maintained for each PCM along with its consistency ratio. The utilization of the proposed methods was supported by a case study based on Institute Examination System (IES).

The second methodology is based on the TOPSIS method to deal the rank reversal issue which generally occurs when few SRs are added or deleted during the SRs selection process. In real life application, people use linguistic variables to specify their preferences on SRs during decision-making process. Therefore, to deal the vagueness and impreciseness during the decision-making process, fuzzy TOPSIS has been used for the selection of SRs. Finally, the applicability of the proposed method is explained with the help of a case study, which is based on IES.