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Ph.D. Topic:	**Soft Computing Techniques for the Selection of Software Requirements**

Ph.D. Research Findings

This Thesis attempts to strengthen the software requirements selection methods by proposing three methodologies by using the following soft computing techniques, i.e., fuzzy logic, genetic algorithm, and rough-set theory. There are three main contributions in the present Thesis and are summarized as follows:

- The first contribution to the Thesis is the development of a methodology for the selection of SRs from a large set of requirements using fuzzy Analytic Hierarchy Process (AHP) and fuzzy Technique for Order of Preference by Similarity to Ideal Solution (TOPSIS) techniques. The requirements of an Institute Examination System (IES) were selected with the help of the proposed method. The SRs selection method based on the fuzzy AHP and fuzzy TOPSIS were compared based on the following criteria: (i) agreement measure, (ii) time complexity, (iii) rank reversal issue, and (iv) number of judgements by decision makers.

- The second contribution to the Thesis is the development of a methodology for the selection of SRs using genetic algorithm and fuzzy TOPSIS. In the proposed method, the genetic algorithm is used for generating the fuzzy membership function. Based on this function, the fuzzy numbers are generated for computing the ranking order of the

requirements using fuzzy TOPSIS. The proposed method was applied for selecting the requirements of an IES.

- The third contribution to the Thesis includes the development of a methodology for the selection of goals of an information system using rough-set theory. The proposed method was applied for the selection of goals of an IES in goal-oriented requirements elicitation (GOREL) process. The results of the proposed method were compared with the fuzzy based method for the selection of goals.