SOFT COMPUTING TECHNIQUES IN MULTI-CRITERIA OPTIMIZATION PROBLEMS

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ABSTRACT

Most real-world search and optimization problems naturally involve multiple criteria as objectives. Generally, uncertainty information are basic characteristics when modeling optimization problems. Different solutions may produce trade-offs (conflicting scenarios) among different objectives. A better with respect to one objective may be a compromising one for other objectives. There are various factors that need to be considered to address the problems in multidisciplinary research, which is critical for the overall sustainability of human development and activity. In this regard, in recent decades, decision-making theory has been the subject of intense research activities due to its wide applications in different areas. The decision-making theory approach has become an important means to provide real-time solutions to uncertainty problems. Theories like probability theory, fuzzy set theory, type-2 fuzzy set theory, rough set, and uncertainty theory, available in the existing literature, deal with such uncertainties. Nevertheless, the uncertain multi-criteria characteristics in such problems are not yet to be explored in-depth and there is much left to be achieved in this direction. Hence, different mathematical models of real-life multi-criteria optimization problems can be developed on various uncertain frameworks with special emphasis on optimization problems.

This topic aims to incorporate recent developments in the area of decision making field. Topics include: Theoretical foundations of MCDM using uncertainty; Aggregation operators and application in MCDM; Multi-criteria in production and logistics; Risk analysis/modeling, sensitivity/robustness analysis; Multi-criteria network optimization; Mathematical programming in MCDM under uncertainty; New trends in multi-criteria decision-making.