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Uncertain Time-Cost Trade off Problems of Construction Projects Using Fuzzy Set Theory

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Abstract : The development of effective decision support tools that adopted in the construction industry is vital in the world we live in today, since it can lead to substantial cost reduction and efficient resource consumption. Solving the time-cost trade off problems and its related variants is at the heart of scientific research for optimizing construction planning problems. In general, the classical optimization techniques have difficulties in dealing with TCT problems. One of the main reasons of their failure is that they can easily be entrapped in local minima. This paper presents an investigation on the application of meta-heuristic techniques to two particular variants of the time-cost trade of analysis, the time-cost trade off problem (TCT), and time-cost trade off optimization problem (TCO). In first problem, the total project cost should be minimized, and in the second problem, the total project cost and total project duration should be minimized simultaneously. Finally it is expected that, the optimization models developed in this paper will contribute significantly for efficient planning and management of construction project.

Keywords : fuzzy sets, uncertainty, optimization, time cost trade off problems
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