
Hyper-heuristics for Solving a Multi-objective Examination Timetabling Problem

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Abstract In this work, we study a multi-objective version [1] of the examination timetabling problem formulation from the International Timetabling Competition (ITC) 2007 [2]; specifically, the approach groups together the objectives based on the multiple stakeholders. We propose the use of selection perturbative hyper-heuristic approaches based on the self-adaptive learning and great deluge (SAGD) algorithm to solve either the original single objective model or the multi-objective model. We also give a hyper-heuristic approach based on NGS-II algorithm to solve the multi-objective model. We compare our experimental results with those obtained from the competition and find the performance of our proposed approaches is comparable with other approaches in the scientific literature. We obtain new best results on the standard benchmark of ITC 2007 examination timetabling problems for several problem instances. In addition, experimental results over the multi-objective model show that, generally, the performance of our hyper-heuristic, based on SAGD combined with the scalarisation technique and Pareto sorting, outperforms the NGS-II based hyper-heuristic.

Keywords multi-objective optimisation · hyper-heuristic · timetabling · meta-heuristic

References

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