

An Evolutionary Non-Linear Great Deluge Approach for Solving Course Timetabling Problems

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The aim of this paper is to extend our non-linear great deluge algorithm into an evolutionary approach by incorporating a population and a mutation operator to solve the university course timetabling problems. This approach might be seen as a variation of memetic algorithms. The popularity of evolutionary computation approaches has increased and become an important technique in solving complex combinatorial optimisation problems. The proposed approach is an extension of a non-linear great deluge algorithm in which evolutionary operators are incorporated. First, we generate a population of feasible solutions using a tailored process that incorporates heuristics for graph colouring and assignment problems. The initialisation process is capable of producing feasible solutions even for large and most constrained problem instances. Then, the population of feasible timetables is subject to a steady-state evolutionary process that combines mutation and stochastic local search. We conducted experiments to evaluate the performance of the proposed algorithm and in particular, the contribution of the evolutionary operators. The results showed the effectiveness of the hybridisation between non-linear great deluge and evolutionary operators in solving university course timetabling problems.