

Evolutionary Non-linear Great Deluge for University Course Timetabling

Abstract

This paper presents a hybrid evolutionary algorithm to tackle university course timetabling 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. That initialisation process is capable of producing feasible solutions even for the 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 conduct experiments to evaluate the performance of the proposed hybrid algorithm and in particular, the contribution of the evolutionary operators. Our results show that the hybrid between non-linear great deluge and evolutionary operators produces very good results on the instances of the university course timetabling problem tackled here.