A PSO inspired asynchronous cooperative distributed hyper-heuristic for course timetabling problems

ABSTRACT

This paper presents a novel approach for asynchronous cooperative hyper-heuristic incorporated with particle swarm optimisation which inspired by social individual behaviour of swarm intelligence, like bird flocking and fish schooling. The proposed hyper-heuristic algorithm starts with a complete solution and tries to improve the soft constraints, whilst always remaining in the feasible region of the search space. The performances of the proposed cooperative hyper-heuristics are evaluated using the standard course timetabling benchmark problem. From the experimental results, it shows that the proposed Asynchronous Cooperative Distribute Low-level heuristics (ACDLLHs) algorithm is able to find new best solutions for all five medium problem instances and shared optimal solutions for all five small instances. When coupled with two, four and six agents, the Asynchronous Cooperative Distributed Hyper-heuristic (ACDHH) algorithm is able to improve the solution quality for a large instance.