

Systematic review and open challenges in hyper-heuristics usage on expensive optimization problems with limited number of evaluations

ABSTRACT

Ever since the early introduction of optimization by Kantorovich in 1939 the science and engineering researchers have created vast categories of optimization problems. Throughout the years, these optimization problems moved from classical problems to more challenging complex problems and these transformations were direct results of industrial demands. Consequently, this has given rise to one of the new classes of challenging optimization problems known as expensive optimization. A problem is considered expensive when it involves very high computational costs due to the complex evaluations of highdimensional and time-consuming objective functions. In this paper, the past researches that were done in this new research domain are presented followed by a discussion of the hyper-heuristics history and how hyper-heuristics is used in solving expensive optimization problems especially in expensive optimization with a limited number of evaluations.