Application of Sub-Population Scheduling Algorithm in Multi-Population Evolutionary Dynamic Optimization

Authors
Javidan Kazemi Kordestani, Mohammad Reza Meybodi

Description
Many problems in real-world applications involve optimizing a set of parameters, in which the objectives of the optimization, some constraints, or other elements of the problems may vary over time. If so, the optimal solution (s) to the problems may change as well. Generally speaking, various forms of dynamic behavior are observed in a substantial part of real-world optimization problems in different domains. Examples of such problems include the dynamic resource allocation in shared hosting platforms [1], dynamic traveling salesman problem that changes traffic over time [2], dynamic shortest path routing in MANETs [3], aerospace design [4], pollution control [5], ship navigation at sea [5], dynamic vehicle routing in transportation logistics [6], autonomous robot path planning [7], optimal power flow problem [8], dynamic load balancing [9], and groundwater contaminant source identification [10].

Evolutionary computation (EC) techniques have attracted a great deal of attention due to their potential for solving complex optimization problems. Even though they are effective for static optimization problems, they should undergo certain adjustments to work well when applied to dynamic optimization problems (DOPs). The reason is that the dynamic behavior of DOPs poses two additional challenges to the EC techniques:(i) outdated memory: when a change occurs in the environment, the previously found solutions by the algorithm may no longer be valid. In this case, the EC algorithm will be misled into moving toward false positions.(ii) Diversity loss: this issue appears due to the tendency of the

Scholar articles
Application of Sub-Population Scheduling Algorithm in Multi-Population Evolutionary Dynamic Optimization
JK Kordestani, MR Meybodi - Evolutionary Computation in Scheduling, 2020
All 2 versions