Abstract

Swarm-based algorithms simulate a performance about a set of animals that searching for food. At other iteration, a solution was usually built based on actual knowledge gained by former ages. Moth flame Optimization Algorithm (MFO) there is one popular way of selection method called global best that is used as the best solution obtained to derive the search and used it in the process of generating the upcoming solutions. This way will lose the diversity of MFO because it centered on selection only from the best solution amongst the total solutions. The MFO algorithm was developed on three stages in this research, first hybridizing it with the Hill Climbing (HC) algorithm and given MFOHC in order to use local research techniques and speed up the search mechanism, to improve the convergence rate. second, to study different selection methods and displace the global best method of MFO to enhance performance, that be advance diversity of solutions in MFO, by implement sex selection schemes Linear Ranking Selection Scheme (LRSS), Proportional Selection Scheme (PSS), Greedy Selection Scheme (GSS), Tournament Selection Scheme (TSS), Truncation Selection Scheme (TrSS), and Exponential Ranking Selection Scheme (ERSS) and choose the PMFOHC as the best variation of them. Then, the performance of the proposed PMFOHC variations is evaluated and a comparative study is conducted. The experimental results using 30 Benchmark Functions and Congress on Evolutionary Computation (CEC) 2017 show that the selection schemes directly affect positively the performance of the PMFOCH algorithm. Finally, the best version PMFOHC applied to the different sizes from the TSP dataset, the results proved high

performance and distinct for the new version PMFOHC compared to the results of other algorithms.

Keywords: MFO, Hill Climbing (HC), TSP, Selection Schemes, Benchmark Functions and Congress on Evolutionary Computation (CEC) 2017.