Evaluation of Different Horizon Lengths in Single-agent Finite Impulse Response Optimizer

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Abstract

Single-agent Finite Impulse Response Optimizer (SAFIRO) is a newly single solution-based metaheuristic optimization algorithm which mimics the work procedure of the ultimate unbiased finite impulse response (UFIR) filter. In a real UFIR filter, the horizon length, N plays an important role to obtain the optimal estimation. In SAFIRO, N represents the repetition number of estimation part that needs to be done in finding an optimal solution. In the original SAFIRO, $N = 4$ is assigned. In this study, the effect of N towards the performance of SAFIRO is evaluated by assigning N between the range of 4 to 10. The CEC 2014 benchmark test suite is used for performance evaluations. Statistical analysis using the nonparametric Friedman test was performed to observe the performance. Experimental results show that N is a function dependent parameter where for certain functions, SAFIRO performs better with a larger value of N. However, for certain functions, SAFIRO performs better with a minimum value of N.

Keywords—horizon length; optimization; SAFIRO