

PSO-LFDE Algorithm on Constrained Real-Parameter Optimisation Test Functions

Nafrizuan Mat Yahya & Nur Iffah Mohamed Azmi*

Faculty of Manufacturing and Mechatronic Engineering Technology, Universiti Malaysia
Pahang

ABSTRACT:

This paper introduces a new version of the particle swarm optimisation (PSO) algorithm particle swarm optimisation with Lévy Flight and the Doppler Effect (PSO-LFDE), maintaining an optimal balance between the exploration and exploitation phases of the optimisation process. The proposed algorithm will hold a better exploration–exploitation equilibrium if the contributions of convergence and diversity and global and individual bests in attracting particles are maintained in balance. The proposed PSO-LFDE algorithm is compared with the PSO algorithm by Gaing on single-objective constrained real-parameter optimisation test functions. The results indicated that the PSO-LFDE has achieved competitive results on the single-objective constrained real-parameter optimisation test functions as compared to PSO algorithm by Gaing. Thus, the PSO-LFDE is validated as a stable, well-designed algorithm and can be a functional alternative approach to deal with various single-objective constrained real-parameter optimisation problems.

KEYWORDS:

PSO; Optimisation; Single objective function

ACKNOWLEDGMENT

The authors would like to thank Universiti Malaysia Pahang for providing financial support through the UMP Internal Grant (Grant No. RDU210370) and Faculty of Manufacturing and Mechatronics Engineering Technology, Universiti Malaysia Pahang for laboratory facilities.