Lecture Notes in Electrical Engineering 607

Akhtar Kalam
Khaleequr Rehman Niazi
Amit Soni
Shahbaz Ahmed Siddiqui
Ankit Mundra *Editors*

Intelligent Computing Techniques for Smart Energy Systems

Proceedings of ICTSES 2018

Springer

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EE|23,24

Adaptive Inertia-Weighted Firefly Algorithm

Shailja Sharma, Pooja Jain and Akash Saxena

Abstract Real-life optimization problems required more and more technique, which completely utilizes the search spaces to obtain the best optimal solution, so researchers have an opportunity to propose a new technique or a modified version of the existing technique. In this order, this paper is a new modified version of nature-inspired metaheuristic firefly algorithm. FA is swarm intelligence algorithm inspired by flashing pattern and behavior of fireflies. FA has a tendency to trap in local optima and shows a slow convergence for optimization problems. To overcome these problems, in the proposed variant we add an adaptive inertia weight to update the position of search agents. To validate the performance of the proposed variant, it is tested on 23 traditional benchmark functions. The static and numerical results confirm the efficacy of the proposed variant over the original algorithm.

Keywords Firefly algorithm · Improve firefly algorithm · Inertia weight

1 Introduction

Optimization refers to the process of searching for the best solution for a particular problem. An optimization technique used to find out the optimal solution from all available possible solutions. Since long, conventional search methods have been used to solve optimization problems, although these methods give promising results in many problems, sometimes they may fail to solve complex optimization problems. If in the optimization problem the number of decision variables is very large and their effect on objective function is significant then such problems cannot be solved by conventional methods. So to solve these complex optimization problems, efficient methods of optimization are needed.

S. Sharma (✉) · P. Jain · A. Saxena
Swami Keshvanand Institute of Technology, Management and Gramothan, Jaipur, Jagatpura, Jaipur, India
e-mail: shailjasharma@outlook.com

A. Kalam et al. (eds.), *Intelligent Computing Techniques for Smart Energy Systems*,
Lecture Notes in Electrical Engineering 607,
https://doi.org/10.1007/978-981-15-0214-9_53