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Simulated Kalman Filter Algorithm with Improved Accuracy



Mohd Falfazli Mat Jusof, Ahmad Azwan Abd Razak, Shuhairie Mohammad, Ahmad Nor Kasruddin Nasir, Mohd Helmi Suid, Mohd Ashraf Ahmad and Zuwairie Ibrahim

Abstract This paper presents an improved Simulated Kalman Filter optimization algorithm. It is a further enhancement of a Simulated Kalman Filter (SKF) optimization algorithm. SKF is a random based optimization algorithm inspired from Kalman Filter theory. An exponential term is introduced into Estimation stages of SKF to speed up the searching process and gain more chances in finding better solutions. Cost function value that represents an accuracy of a solution is considered as the ultimate goal. Every single agent carries an information about the accuracy of a solution in which will be used to compare with other solutions from other agents. A solution that has a lower cost function is considered as the best solution. The algorithm is tested with various benchmark functions and compared with the original SKF algorithm. The result of the analysis on the accuracy tested on the benchmark functions shows that the proposed algorithm outperforms SKF significantly. Graphical results of the test show that the SKFLA has faster convergence speed as compared to SKF.

Keywords Simulated Kalman filter · Optimization algorithm · CEC2014

1 Introduction

Most of the real world problems are complex in its structure or landscape, have different properties and consist of various dimensions. Naturally, a problem that encountered in real life might consists of unimodal, multimodal, or dynamic fitness landscapes. Therefore, a good optimization algorithm is needed to solve this kind

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