MATERIAL POINT DYNAMICS- BASED LEVY PARTICLE SWARM OPTIMIZATION

A. Toumi[1], N. Rechid[1], A. Taleb-Ahmed[2], K. Benmahammed[3]

1. University Mohamed Khider Biskra Algeria
a.toumi@univ-biskra.dz

2. LAMIH UMR CNRS UVHC 8201, Valenciennes, France
taleb@univ-valenciennes.fr

3. University Farhat Abbas Setif Algeria
khierben@gmail.com

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1 Introduction

In recent years, artificial intelligent tools have dominated the optimization domain. Particle Swarm Optimization algorithm is one of the best. Since it was introduced, it was subjected to several modifications at update equations level, especially the velocity equation [1, 3- 6, 8, 10- 14]. When developing new versions of the PSO algorithm, the almost modifications have occurred in velocity updating equation which is taken as a critical parameter of the algorithm. But the second updating equation (position) is in any case less important, and there is where our contribution is located. This work presents a modification introduced to the PSO algorithm. So, our contribution concerns the modification of the position's update equation by the addition of a new term. This term is obtained from the elementary notions of physics concerning moving material point dynamics. It will give equilibrium to the position update equation which was the sum of two quantities physically different, position and velocity, and our modification is introduced regarding the physics laws. The developed algorithm was applied on some commonly used test functions to evaluate its characteristics. The obtained results were excellent.

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