

## 1. Introduction

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The PSO algorithm is inspired by the social behaviour of birds or in other words fish. PSO algorithm is a Swarm-swarm Intelligence-intelligence-based optimization algorithm which was presented by Kenedy and Eberhart in the middle-1990s [6]. This algorithm was has been widely extensively welcomed owing to, since it has its more simple mechanism in addition to its and so very high efficiency, so it can be said thus, that its implementation is so much easier and simpler than those of other optimization algorithms. Basically, this algorithm has been designed to solve single-single-solution optimization problems, but moreover, the mechanism of particles' motion in this algorithm has been designed in a way that, by applying some modifications, it has been could be converted into a suitable algorithm to in terms of solve-solving MMO problems. This algorithm starts by distributing random particles in the problem space. For each particle, its position, speed, and cost function values are considered and each particle has a memory where in which the value and position of the best solution obtained solution, is called personal best, are maintained by the particle itself which is named personal best. Also, there is a variable which maintains the value of cost function and position of the best solution obtained from all particles that and is named called global best. The new position of each particle is updated with by its speed by using equation Equation (1):

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The EPSO algorithm was proposed by J.Barrera and Carlos A.C. in 2009 [9]. In this algorithm, in this method by modifying the mechanism of selecting the global optimum in PSO algorithm, they have tried to solve optimization problems are solved by modifying the mechanism of selecting global optimum in PSO algorithm. By applying coulomb's-Coulomb's law shown in equation Equation (2), the particles to be which should be selected separately selected as the global optimum for each particle are calculated. In fact, the particles may move toward different particles as global optimum, i.e. it means that for each particle, it is possible that the global optimum can be different, which and this leads to the fact that particles aggregate around local optimum in addition to the global optimum optima. It is obvious that more particles are aggregated around a the point with a better cost function value. The feature of coulomb's-Coulomb's law is that, the particles tend to move toward a point with which has suitable distance to from that particle in addition to and the a suitability of its cost function.

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FERPSO [7] which was proposed by Xiaodong Li (2007) is a commonly used algorithm for presented to solve-solving MMO problems until now. This algorithm has been proposed by Xiaodong Li in 2007. We could describe the behavior of this algorithm in could be described based on the nature viewpoint of view the way that, where if there are is more foods food in a place, more birds are will aggregated there. In fact, if birds find suitable food near-around them, they would not go toward even more resources in-at far points. In this algorithm, by applying equation Equation (2), the particles to be which are supposed to be selected as a global optimum for each individual particle are calculated. In fact, the general structure of FERPSO and EPSO are is more very similar to each other and both have the same level of complexity.