Happiness and Health Particle Swarm Optimization

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***Abstract*—Particle Swarm Optimization (PSO) is a popular and widely used optimization algorithm for solving complex problems. It is known for its simplicity and ease of implementation. Artificial Birds move in search space to find optimal solution. Although many PSO algorithms were proposed in literature the concepts like happiness and health are not yet explored in PSO algorithms. This article is based on this research gap. Happiness and Health Particle Swarm Optimization (HaHePSO) algorithm is created by incorporating the Happiness and Health concepts into Particle Swarm Optimization algorithm. Each particle in HaHePSO algorithm is associated with happiness and health variables. The movement of Artificial Birds in PSO algorithm is based on fitness values. In HaHePSO algorithm the movement of Artifical Birds is dependent on happiness, health and fitness values. In PSO algorithm Artificial Birds move in the direction of local best and global best of fitness values. This idea is extended in HaHePSO algorithm where Artificial Birds move in the direction of local best and global best of happiness, health and fitness values. The HaHePSO algorithm proposed in this article takes more space and requires extra computation compared to PSO algorithm. This is due to the fact that each particle now has happiness and health variables associated with it and movement in search space is guided by the fitness, happiness and health values.**

Keywords—Particle Swarm Optimization, PSO, Happiness, Health, Happiness and Health Particle Swarm Optimization, HaHePSO, Artificial Intelligence, AI

I. INTRODUCTION

In [1] Money Particle Swarm Optimization (MyPSO) is created by incorporating the money concept into Particle Swarm Optimization (PSO) algorithm. In this article the concept of health and happiness is incorporated into PSO algorithm for creating Happiness and Health Particle Swarm Optimization (HaHePSO). For the sake of simplicity the literature review [2] – [20] for this article is taken from article [1]. Second section is about PSO. Happiness and Health Particle Swarm Optimization (HaHePSO) is explained in third section. Finally conclusions are made in fourth section.

II. PARTICLE SWARM OPTIMIZATION

Particle Swarm Optimization (PSO) algorithm is explained in article [1].

III. HAPPINESS AND HEALTH PARTICLE SWARM OPTIMIZATION

In Happiness and Health Particle Swarm Optimization (HaHePSO), happiness_localbesti,dim, happiness_globalbestdim, health_localbesti,dim, health_globalbestdim are additionally maintained. In line number 7 velocityi,dim is updated such that each Artificial Bird (abi,dim) moves towards local best and global best of happiness, health and fitness values.

Procedure: Happiness and Health Particle Swarm Optimization (HaHePSO)
1) All Artificial Birds are initialized in this step
2) Present iteration number is initialized to zero
3) Identification of global and local best of all Artificial Birds is done in this step.
4) Identification of global and local happiness best of all Artificial Birds is done in this step.
5) Identification of global and local health best of all Artificial Birds is done in this step.
6) Loop for each Artificial Bird and for each dimension
7) velocityi,dim = weight*velocityi,dim +
Const1*Rand*(localbesti,dim – abi,dim)
+Const2*Rand*(globalbestdim – abi,dim)
+Const3*Rand*(happiness_localbesti,dim – abi,dim)
+ Const4*Rand*(happiness_globalbestdim – abi,dim)
+Const5*Rand*(health_localbesti,dim – abi,dim)
+ Const6*Rand*(health_globalbestdim – abi,dim)
8) positioni,dim = positioni,dim + velocityi,dim
9) Termination of for loop
10) Present iteration number is increased by one
11) if termination condition is not reached then loop again

IV. CONCLUSIONS

Happiness and Health Particle Swarm Optimization (HaHePSO) algorithm is introduced in this article. In this algorithm each particle is associated with happiness and health variables. Artificial Birds in HaHePSO algorithm move towards happiness and health best values in addition to normal fitness best values. It may not be a good idea to conclude Happiness and Health Particle Swarm Optimization algorithms will perform better without further research and development in this direction.

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