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Letter to Editor

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Abstract

VHAAI and ISVHAAI are closely related to each other where ISVHAAI Artificial Intelligence Society applies VHAAI to deal with various problems. A unique algorithm titled Food Human Swarm Optimization (FoodHSO) has been designed in this Letter No. 9 of ISVHAAI AI Society Letters.

Keywords: AI, VHAAI, ISVHAAI, Humans, Swarm, Food, Human Swarm Optimization, HSO, Food Human Swarm Optimization, Food HSO

Introduction

Swarm Intelligence literature is shown in articles [1-5]. A unique and novel algorithm titled "Food Human Swarm Optimization (FoodHSO)" is designed in this letter. Section 2 shows FoodHSO. Conclusions are made in section 3 followed by references.

Food Human Swarm Optimization

In Food Human Swarm Optimization (FoodHSO), the search space consists of 4 food items and there is probability of consumption for each food item. Line no. 3 to line no. 6 shows probability of consumption of food items. Probability of humans is obtained based on fitness values in lines 7 to 9. In line no. 10, for each human loop is started. In lines 11 to 14 Direction of movement `mov_dir` is obtained. Based on random number `Rn` generated and probabilities of 4 food items one of the 4 food items is consumed by human. This is shown in lines 15 to 19. Lines 20 to 23 shows food coefficients of 4 food items. The position update equation is different for different food item consumed as shown in lines 24 to 27. Loop for each human is ended in line no. 28. Generation is incremented by 1. This process is continued until termination condition is reached in line no. 30.

Procedure: Food Human Swarm Optimization (FoodHSO)

- Initialization of population of Humans
- Initialize generation to 0
- Probability_food1 = 0.25
- Probability_food2 = 0.25
- Probability_food3 = 0.25
- Probability_food4 = 0.25
- Fitness values calculation
- Calculate Sum_fitness
- Calculate probability for each human
- Loop for each human:
 - R = Random Number Generated
 - Obtain target Human T based on R and probabilities
 - $mov_dir = (T - human)$
 - $mov_dir = mov_dir / magnitude(mov_dir)$
 - Generate random number Rn
 - If $0 < Rn < 0.25$ then: Food1 is consumed by human
 - Else if $0.25 < Rn < 0.5$ then: Food2 is consumed by human
 - Else if $0.50 < Rn < 0.75$ then: Food3 is consumed by human
 - Else if $0.75 < Rn < 1$ then: Food4 is consumed by human
 - Food_coefficient1 = 0.5
 - Food_coefficient2 = 1
 - Food_coefficient3 = 1.5
 - Food_coefficient4 = 2
 - If Food1 is consumed by human then: $Pos = Pos + mov_dir * Food_coefficient1 * Step$
 - Else if Food2 is consumed by human then: $Pos = Pos + mov_dir * Food_coefficient2 * Step$
 - Else if Food3 is consumed by human then: $Pos = Pos + mov_dir * Food_coefficient3 * Step$
 - Else if Food4 is consumed by human then: $Pos = Pos + mov_dir * Food_coefficient4 * Step$
 - End loop for each human
- generation is incremented by 1
- loop until termination condition is reached

Conclusions

Food Human Swarm Optimization (FoodHSO) is the novel algorithm deigned in this letter. The position update equation depends on the food item consumed and there is probability of consumption for each food item. There is scope to change number and probability of food items. One can also experiment with different values for food coefficients that are used in position update equation

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