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ISVHAAI AI Society Letters: Vehicles Human Swarm Optimization (VHSO)

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Abstract
VHAAI (Very Highly Advanced Artificial Intelligence) and ISVHAAI (International Society for VHAAI) are linked to each other where ISVHAAI is an AI Society which uses VHAAI field to solve problems. Vehicles Human Swarm Optimization (VHSO) is a new algorithm designed in this Letter No. 12 of ISVHAAI AI Society Letters.

Keywords: Artificial Intelligence, AI, Human, Swarm, Human Swarm Optimization, HSO, Vehicles, Vehicles HSO, VHSO

Introduction
Swarm Intelligence has been used for vehicles as shown in articles [1-5]. In this paper, Humans and Vehicles are taken as inspiration to design a novel algorithm titled Vehicles Human Swarm Optimization (VHSO). VHSO is explained in Second section followed by Conclusions. References are available at the end.

Vehicles Human Swarm Optimization
Vehicles Human Swarm Optimization (VHSO) is explained in this section. Human Population is initialized followed by setting Generation counter to 0. Fitness values of all Humans are calculated. Human_Best is identified. Humans use four vehicles Cycle, Motorcycle, Car, Aeroplane to move in the search space. The Probability of Selection of each vehicle is 0.25. Loop for each Human is started in line no. 9. A unit vector towards the direction of Human_Best is obtained. A random number V is generated. Based on V and Vehicle Probabilities, Human gets a vehicle to move in the search space. Each vehicle has certain Movement Magnitude. If Cycle is selected then Human moves along Direction_of_Movement and magnitude of this movement is Cycle_Movement_Magnitude multiplied by Step value.

If Motorcycle is selected then Human moves along Direction_of_Movement and magnitude of this movement is Motorcycle_Movement_Magnitude multiplied by Step value. If Car is selected then Human moves along Direction_of_Movement and magnitude of this movement is Car_Movement_Magnitude multiplied by Step value. If Aeroplane is selected then Human moves along Direction_of_Movement and magnitude of this movement is Aeroplane_Movement_Magnitude multiplied by Step value. Loop of Humans is ended in line no.25. Generation counter is incremented by one. This process continues until Termination condition is reached in line no. 27.

Procedure: Vehicles Human Swarm Optimization (VHSO).
- Population Initialization of Humans.
- Generation = 0.
- Calculate fitness values of all Humans.

- Identify Human_Best which has best fitness value.
- Cycle_Probability = 0.25.
- Motorcycle_Probability = 0.25.
- Car_Probabilty = 0.25.
- Aeroplane_Probability = 0.25.

Loop for each Human:
- Direction_of_Movement = Human_Best – Human.
- Convert Direction_of_Movement into Unit vector.
- Generate random number V.
- If 0<V<0.25 then: Cycle is selected by Human.
- Else if 0.25<V<0.5 then: Motorcycle is selected.
- Else if 0.5<V<0.75 then: Car is selected.
- Else if 0.75<V<1 then: Aeroplane is selected.
- Cycle_Movement_Magnitude = 0.5.
- Motorcycle_Movement_Magnitude = 1.
- Car_Movement_Magnitude = 1.5.
- Aeroplane_Movement_Magnitude = 2.

If Cycle is Selected then:
Loc = Loc + Direction_of_Movement*
Cycle_Movement_Magnitude *Step.

If Motorcycle is Selected then:
Loc = Loc + Direction_of_Movement*
Motorcycle_Movement_Magnitude *Step.

If Car is Selected then:
Loc = Loc + Direction_of_Movement*
Car_Movement_Magnitude*Step.

If Aeroplane is Selected then:
Loc = Loc + Direction_of_Movement*
Aeroplane_Movement_Magnitude*Step.
- End the loop of Humans.
- Increment Generation counter by one.
- This process continues until Termination condition is reached.

Conclusion

A unique algorithm titled Vehicles Human Swarm Optimization (VHSO) has been designed in this article. An innovative idea that the Humans move on vehicles is explored in this article. There is scope to use more number of vehicles and different probabilities for each vehicle. One can experiment with different Vehicle Movement Magnitudes in the position update equations. Researchers can take inspiration from Humans and their vehicles to design unique and innovative algorithms working in the direction shown in this article.

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