

**Letter no. 8: Isvhaai AI Society Letters****Satish Gajawada**

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Abstract

VHAAI means Very Highly Advanced Artificial Intelligence. ISVHAAI means International Society for VHAAI. VHAAI field is used by ISVHAAI Society in an attempt to solve problems. A new algorithm titled Friendship Human Swarm Optimization (FdHSO) is designed in this Letter No. 8 of ISVHAAI AI Society Letters.

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Introduction

Articles to show literature related to Swarm Intelligence [1-5]. A unique algorithm titled Friendship Human Swarm Optimization (FdHSO) has been designed in this letter. The next Sections show FdHSO algorithm and Conclusions followed by references at the end.

Friendship Human Swarm Optimization

Friendship_Matrix is initialized in line no. 1. In line no. 2, friends population is initialized. Generation count is set to 0. Fitness values are calculated in line no. 4. Probability is obtained by dividing fitness value

with sum of fitness values of all friends. In line no. 7 probabilities of all friends are calculated. For each friend loop is started in line no. 8. In even Generations, friend moves along best_friend direction and magnitude of this movement is $\text{Direction_Movement} * \text{Friendship_Matrix}[\text{friend}] [\text{best_friend}]$ multiplied by Step value. In odd Generations, friend moves along target friend T where friend T is obtained based on random number R and probabilities of friends. The magnitude of this movement is $\text{Friendship_Matrix}[\text{friend}] [\text{T}]$ multiplied by Step value. Repeat for each friend loop is ended in line no. 20. Generation is incremented by 1. Repeat the process until termination

condition is reached in line no. 22.

Procedure

Friendship Human Swarm Optimization (FdHSO)

- Initialize Friendship_Matrix
- Initialize Population of Friends
- Set generation to 0
- Calculate fitness values
- $\text{fitness_sum} = \text{Sum of fitness values of population}$
- $\text{probability} = \text{fitness} / \text{fitness_sum}$
- Calculate probabilities of all friends
- Repeat for each friend:
 - if friend in even generation:
 - $\text{best_friend} = \text{friend with best fitness value}$
 - $\text{Direction_Movement} = (\text{best_friend} - \text{friend})$
 - Convert Direction_Movement into unit vector
 - $\text{Pos} = \text{Pos} + \text{Direction_Movement} * \text{Friendship_Matrix}[\text{friend}][\text{best_friend}] * \text{Step}$
 - if friend in odd generation:
 - Generate Random number R
 - Based on R and Probabilities select a target friend T
 - $\text{Direction_Movement} = (\text{T} - \text{friend})$
 - Convert Direction_Movement into unit vector
 - $\text{Pos} = \text{Pos} + \text{Direction_Movement} * \text{Friendship_Matrix}[\text{friend}][\text{T}] * \text{Step}$
- End Repeat for each friend loop
- Increment Generation by 1
- Repeat this process until termination condition is reached

Conclusions

A new algorithm titled Friendship Human Swarm Optimization (FdHSO) is designed in this letter. There are different position update strategies for even and odd generations. In even generations friends move along best friend direction where as a different position update strategy is used for odd generations. There is scope to explore in this direction shown in this letter and design more unique Friendship Human Swarm Optimization algorithms.

References

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