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Editorial

Bee Algorithm to Solve Modern World Problem

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DESCRIPTION

Swarm intelligence is all about developing collective behaviors to unravel complex, ill-structured and large-scale problems. Efficiency in collective behaviors depends on a way to harmonies the individual contributors in order that a complementary collective effort may be achieved to supply a useful solution. The most points in organizing the harmony remain as managing the diversification and intensification actions appropriately, where the efficiency of collective behaviors depends on blending these two actions appropriately. A hybrid bee algorithm is presented, which harmonizes bee operators of two mainstream well-known swarm intelligence algorithms inspired of natural honeybee colonies.

Collective intelligence is one amongst the approaches commonly found useful for problem-solving within the nowadays. This can be motivated by the very fact that collective effort pays off better than individual effort within the reality and has been bought in by engineering science researchers and implemented in various problem-solving approaches. Swarm intelligence is thought to be a family of collective problem-solving frameworks like ant colony optimization, particle swarm optimization and artificial bee colonies imposing use of population of solutions, here-forth called swarm of people. The most good thing about population-based metaheuristic approaches, particularly swarm intelligence algorithms, is that the algorithms nicely harmonies local search activities around various neighborhoods without guaranteeing to hide the entire search sp ace.

The ABC has inspired from the organizational nature and foraging behavior of honeybee swarms. Within the ABC algorithm, the bee colony comprises three varieties of bees: employed bees, onlooker bees, and scout bees. Each bee includes a specialized task within the colony to maximize the nectar amount that's stored within the hive. In ABC, each food source is placed within the -dimensional search space and represents a possible solution to the optimization problem. The quantity of nectar within the food source is assumed to be the fitness value of a food source. Generally, the quantity of employed and onlooker bees is that the same and up to the amount of food sources.

The bee's algorithm consists of an initialization procedure and a main search cycle which is iterated for a given number T of times, or until an answer of acceptable fitness is found. Each search cycle consists of 5 procedures: recruitment, local search, neighborhood shrinking, site abandonment, and global search.

The standard bee's algorithm.

1 for i=1,...,ns

i scout[i]=Initialise_scout()

ii flower_patch[i]=Initialise_flower_patch(scout[i])

2 do until stopping_condition=TRUE

i Recruitment()

ii for i =1,...,nb

1 flower_patch[i]=Local_search(flower_patch[i])

2 flower_patch[i]=Site_abandonment(flower_patch[i])

3 flower_patch[i]=Neighbourhood_shrinking(flower_patch[i])

iii for i = nb,...,ns

1 flower_patch[i]=Global_search(flower_patch[i])}

In the local search procedure, the recruited foragers are randomly scattered within the flower patches enclosing the solutions visited by the scouts (local exploitation). If any of the foragers during a flower patch lands on an answer of upper fitness than the answer visited by the scout, that forager becomes the new scout. If no forager finds an answer of upper fitness, the scale of the flower patch is shrunk (neighborhood shrinking procedure). Usually, flower patches are initially defined over an oversized area, and their size is gradually shrunk by the neighborhood shrinking procedure. As a result, the scope of the local exploration is progressively focused on the world immediately near the local fitness best.

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