**Relevant background material [5]**

The Artificial Bee Colony (ABC) algorithm is an optimisation algorithm based on the intelligent behaviour of the honey bee swarm.

Based on the foraging behaviour of the honey bee swarm

Three groups of bees: employed bee, onlookers, and scouts.

Assumption that there is only one artificial employed bee for each for food source (that is, the number of employed bees is equal to the number of food sources available to the hive).

Employed bees go to their food source, come back to the hive, and dance on this area. The bee whose food source has been abandoned becomes a scout and searches for a new food source. Onlookers observe the dances of the employed bees and choose food sources depending on dances.

The position of a food source represents a possible solution to the optimisation problem (presumably it is located in $k$-dimensional space)

The nectar amount of a food sources corresponds to the quality (fitness) of the associated solution.

ABC generates a randomly distributed initial population of $S\_n$ food sources, where $S\_n$ is the size of the swarm.

Selection is stochastic resampling (roulette-wheel selection).

**A detailed pseudocode description of the ABC algorithm [15]**

**A natural language description of the ABC algorithm [10]**

**Details of experiments [15]**

Exploration: searching a wide area of a search space for promising solution

Exploitation: searching a confined area of a search space based on previous results.

Five classical benchmark algorithms (Srinivasan and Seow, 2003) were used to test the performance of ABC against PSO, PS-EA, and GA:

* Griewank (lol)
* Rastrigin function. Value is 0 at its global minimum at the original. Produces many local, regularly distributed minima, so an optimisation algorithm can easily be trapped. Non-convex. The typical example of a non-linear multi-modal function.
* Rosenbrock function.
* Ackley function. Tests how efficiently an algorithm both explores and exploits.

A function is *multimodal* if it has two or more local optima. An optimisation algorithm must avoid over-exploiting the regions around local minima.

**An overview of results [5]**

Define all concepts used and give a very brief overview of the comparator algorithms and the benchmark functions used in the experimental section.

# <https://en.wikipedia.org/wiki/Artificial_bee_colony_algorithm>

Srinivasan, D., Seow, T.H.: Evolutionary Computation, CEC ’03, 8–12 Dec. 2003, 4(2003), Canberra, Australia, pp. 2292–2297.