

Bee algorithm

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Concept



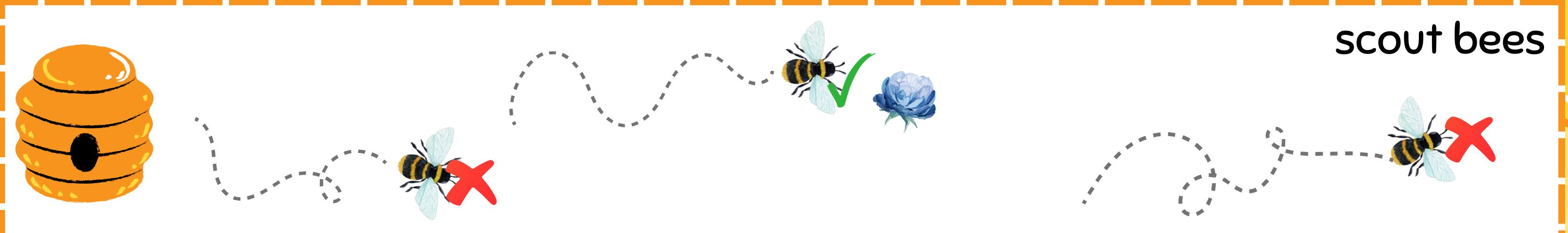
The imitation of the food source foraging behavior of bees



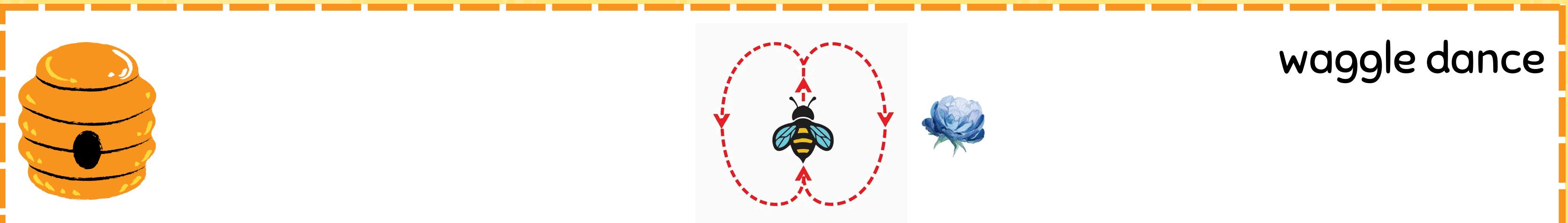
The principle is that "the bees in the swarm cooperate to find the best food sources by exploring and selecting the most potential locations."



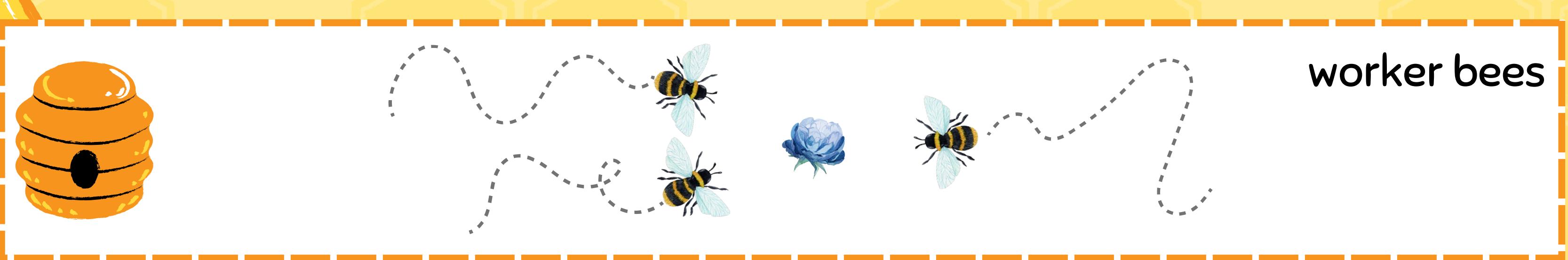
Bee in nature



scout bees



waggle dance



worker bees

Bee algorithm in Optimization

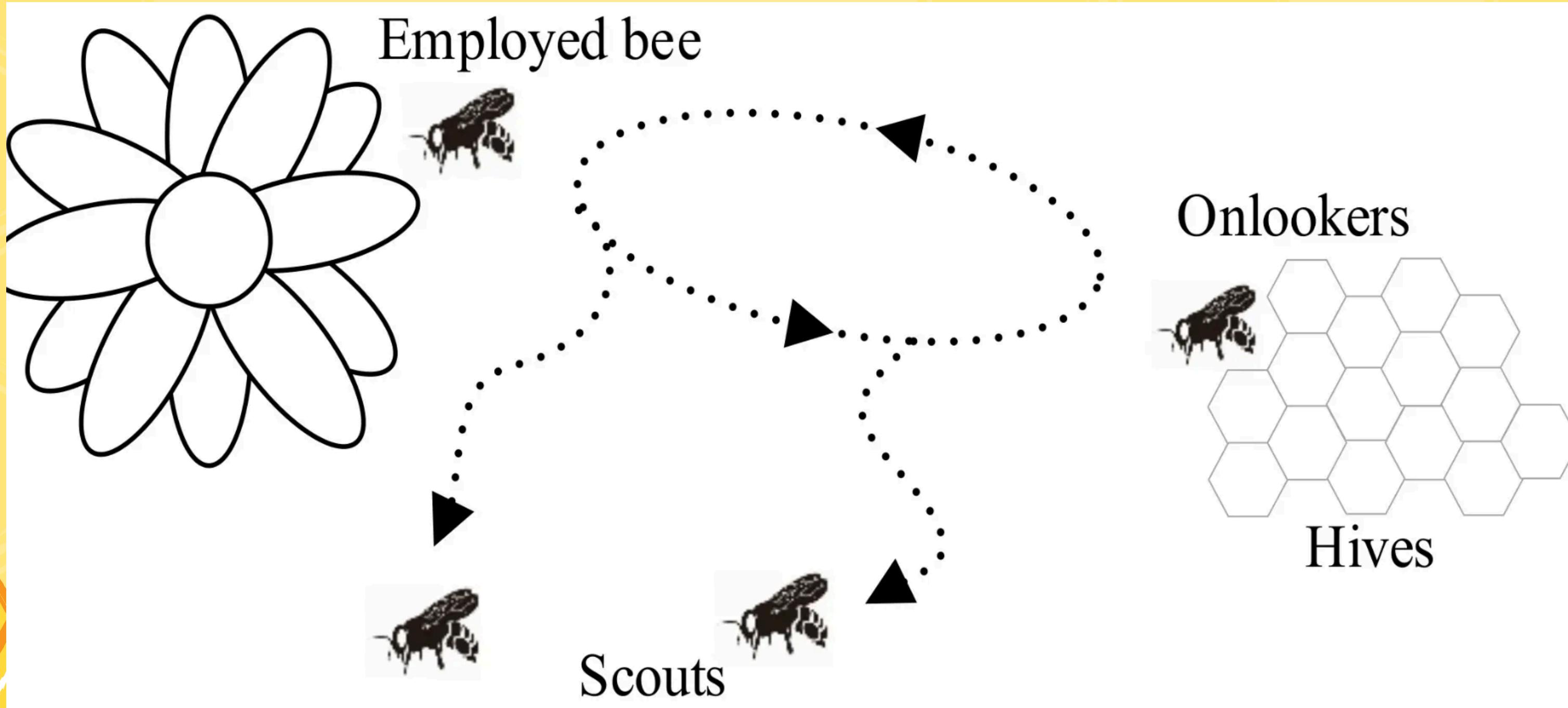
- Exploration: Scout bees search new areas (random solution generation).
- Local Search: Worker bees explore nearby promising sources (refine solutions).
- Selection: Bees choose higher-quality food (select better solutions).



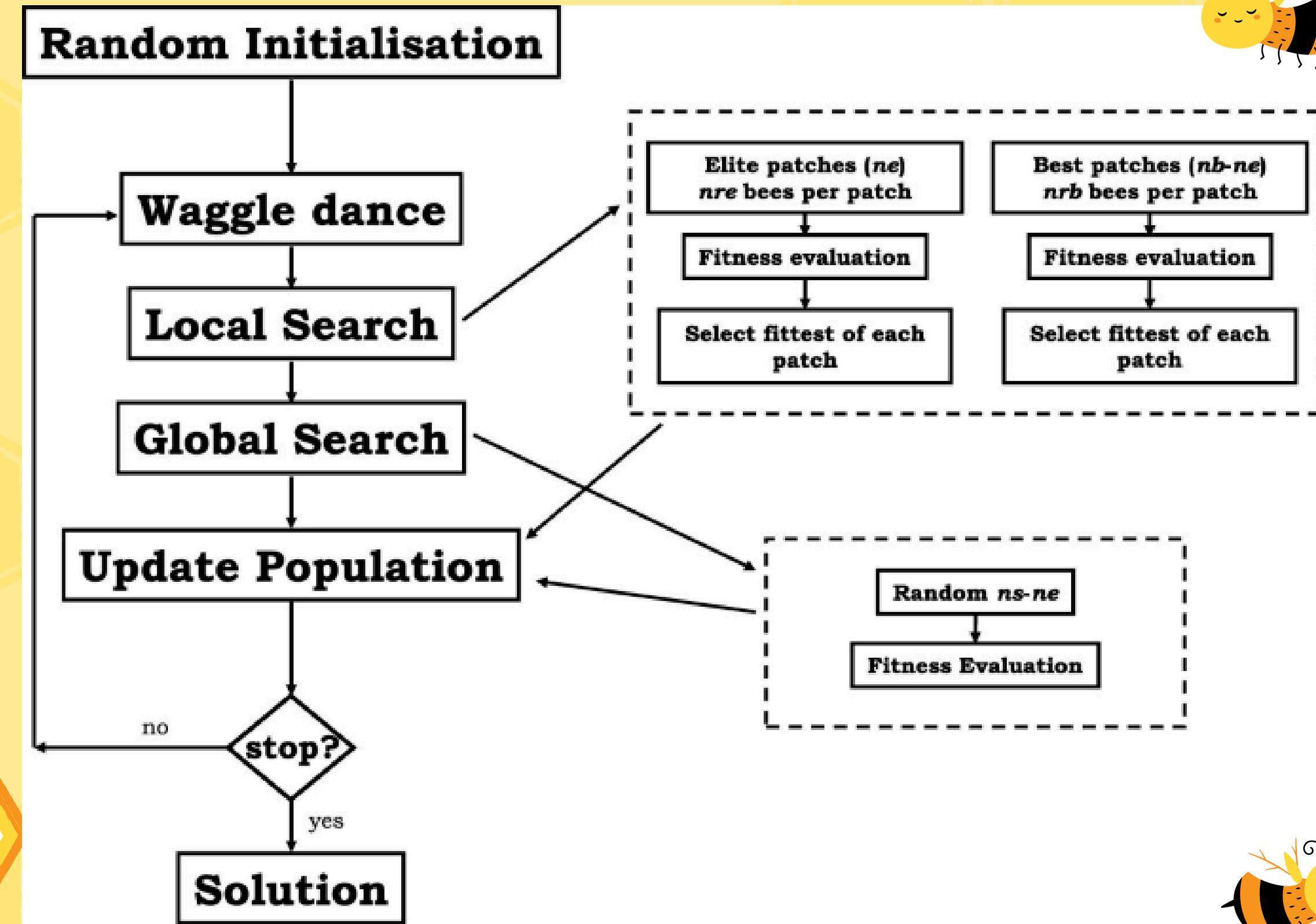
Bee algorithm in Cost function

- The cost function evaluates each potential solution (e.g., food source), and lower cost (or higher fitness) indicates a better solution. Bees explore and refine solutions to minimize the cost function.

How Bee algorithm work ?



How Bee algorithm work ?



Example

Network Design Problem

To design a communication network with the goal of connecting all required points at the lowest possible cost, while ensuring that the connections are secure and stable

Solution:



Reference



<https://botpenguin.com/glossary/bees-algorithm>



https://www.researchgate.net/figure/Flowchart-of-the-basic-Bees-Algorithm_fig1_229698041



<https://beeprofessor.com/waggle-dance/>