

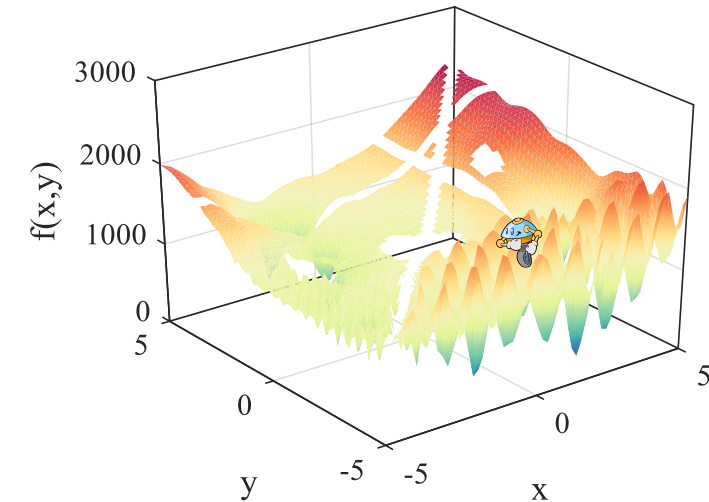
Stochastic

Optimization

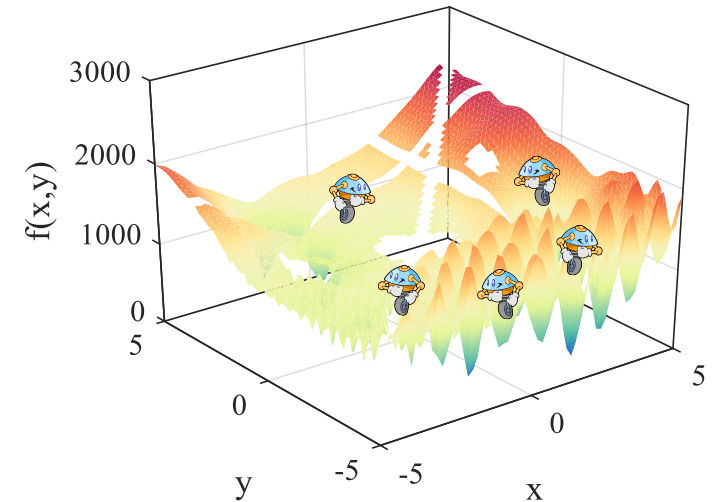
Algorithms

Classification of stochastic optimization algorithms

Individual-based algorithms

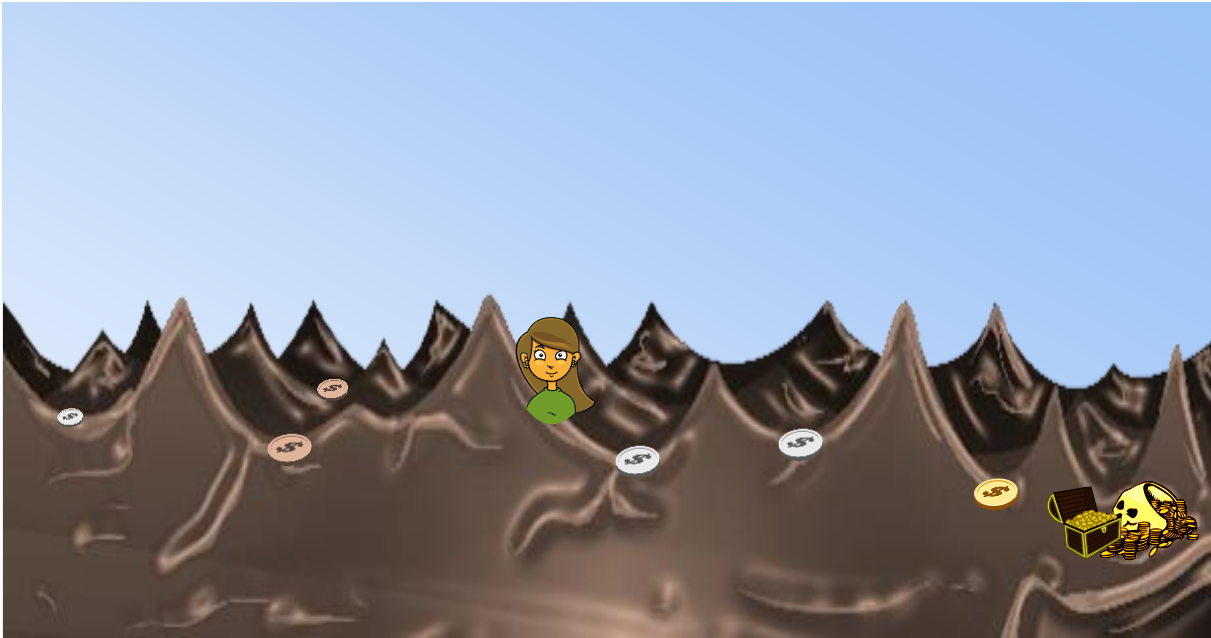


Population-based algorithms



Individual-based **vs.** Population-based

Jennifer



Bob, Anthony, and Jennifer



Individual-based **vs.** Population-based

Minimum function
evaluation

Local optima
stagnation

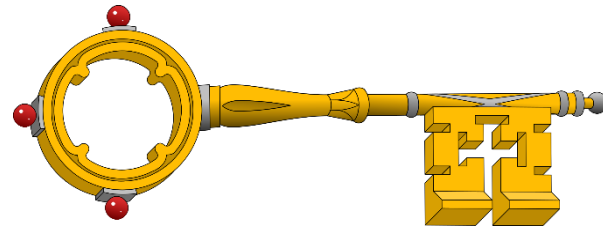


High function
evaluation

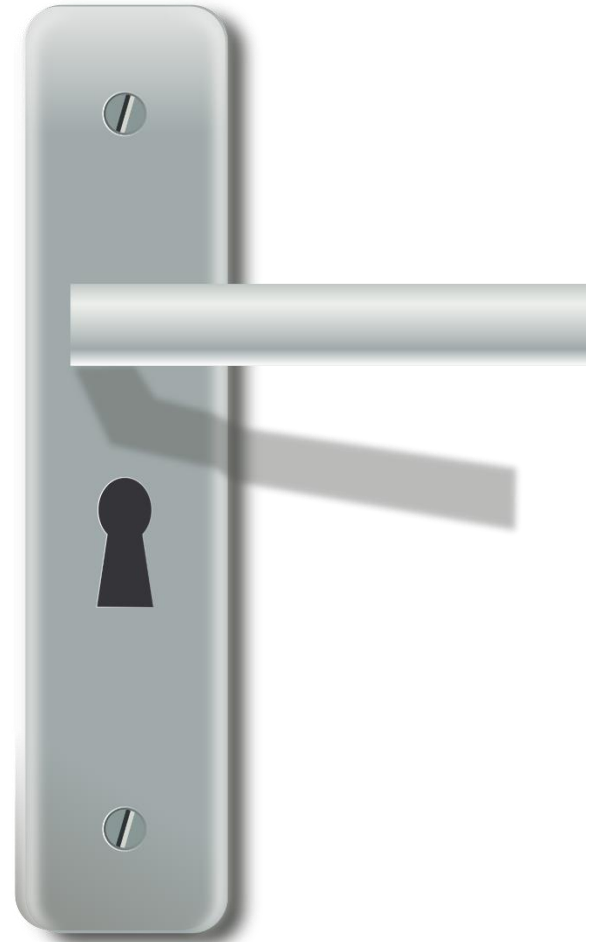
Low stagnation in
local solutions

Population-based algorithms

High exploration



High local optima avoidance



Real-world problems

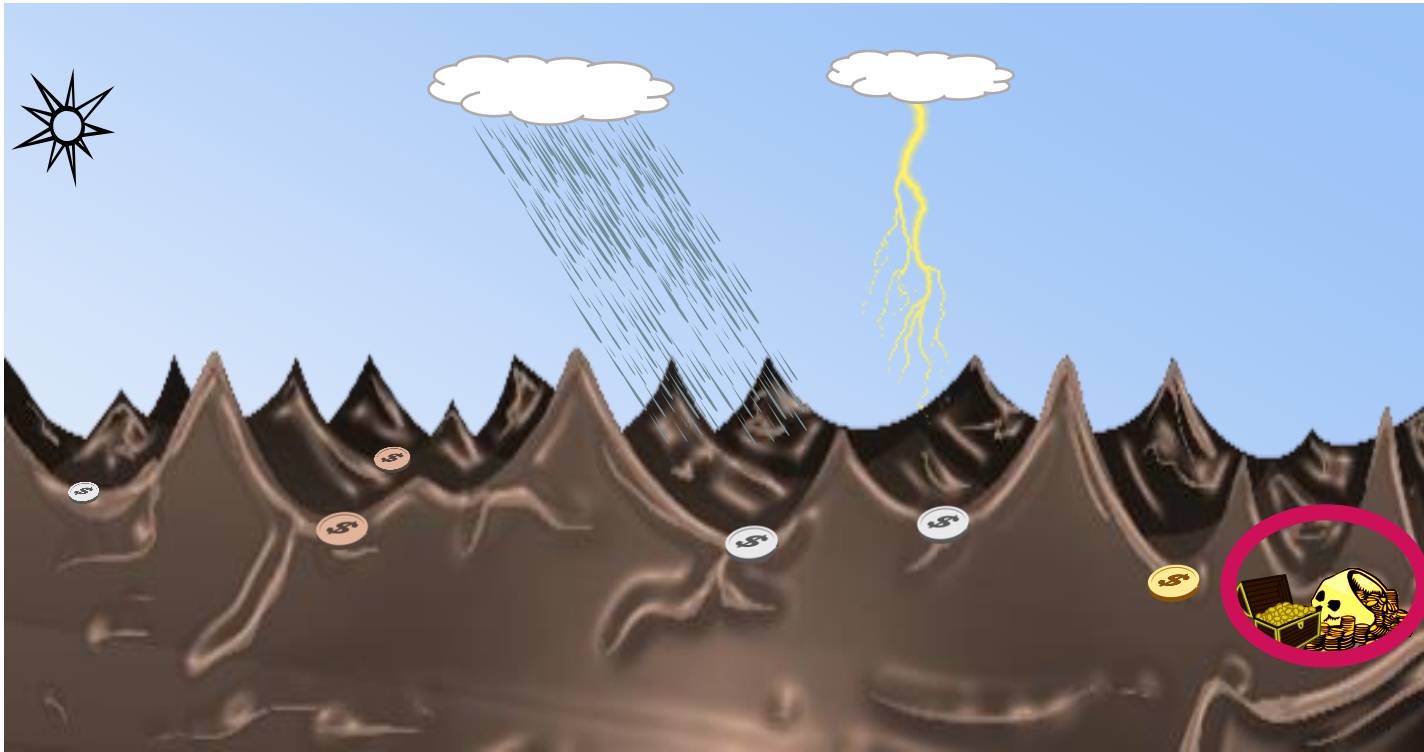
Exploration

vs.

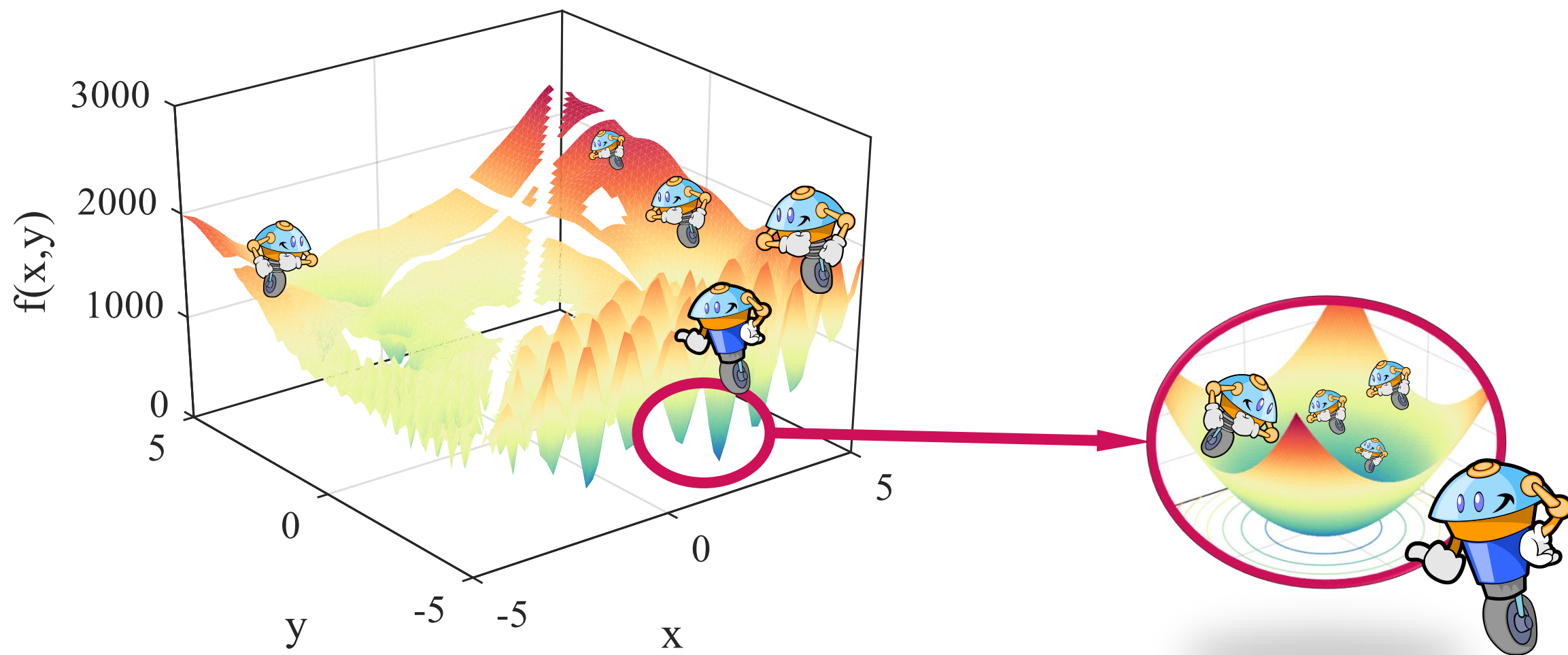
Exploitation



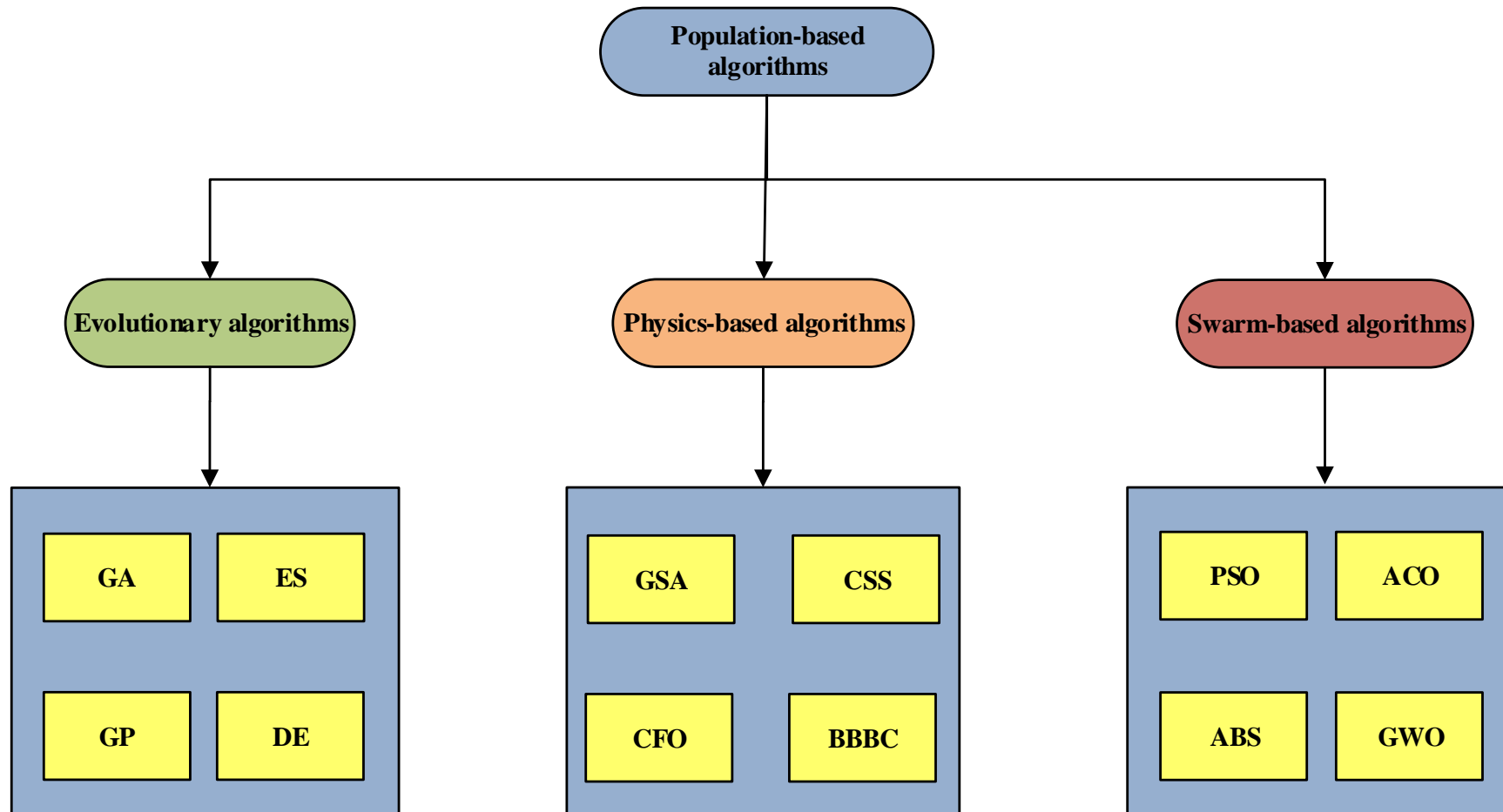
Exploration vs. Exploitation in our analogy



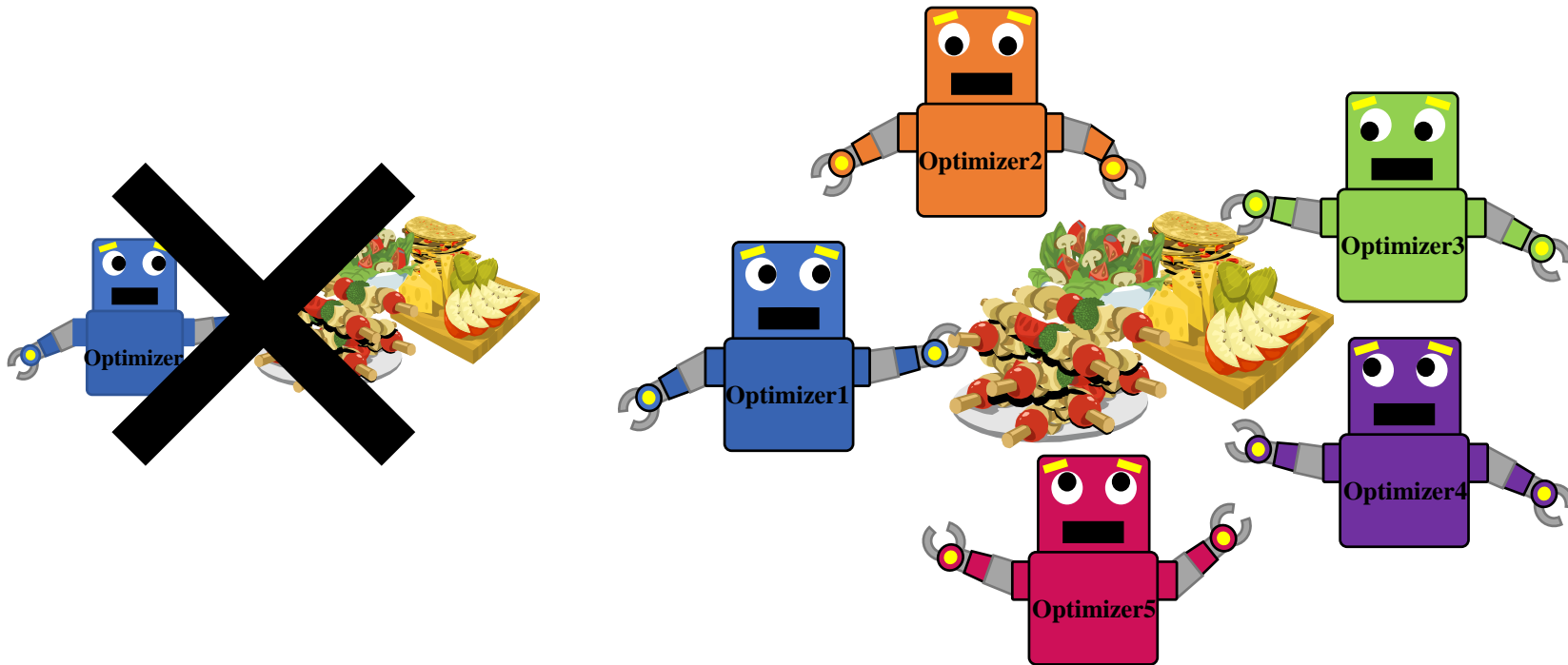
Exploration vs. Exploitation in population-based algorithms



Classification of population-based algorithms



No Free Lunch (NFL) theorem



There is no optimization algorithm to solve all optimization problems

Metaphor-based algorithms

