

Particle Swarm Optimization

A parallelized approach

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Particle Swarm Optimization is an optimization algorithm for nonlinear functions based on bird swarms.

A particle is characterized by a position x , a velocity component v and a performance measure $f(x)$. Each particle needs to perceive the neighbors position, where z is the position of the best neighboring particle, while y is the particle personal best.

At each step, each particle updates:

$$\begin{aligned}v' &= w \cdot v + \phi_1 U_1 \cdot (y - x) + \phi_2 U_2 \cdot (z - x) \\x' &= x + v'\end{aligned}$$

Double column slide

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