Distributed Intelligent Systems
Lab 8 Tutorial

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Exploring PSO

• First portion of lab: run PSO on two benchmark functions: Sphere and Rastrigin function
• Observe how swarm acts when varying parameters
GA and PSO for Robotic Learning

- Second part of lab: use GA and PSO with an Artificial Neural Network to do unsupervised robotic learning
- Design a fitness function for obstacle avoidance
  - Compare with the fitness proposed by Floreano and Mondada
- How is the performance affected by PSO and GA parameter variations
Code Structure

Pso_sup.c

- **Main()**
  - Initialize world
  - Best=pso()
  - Evaluate best

- **calc_fitness()**
  - Reposition robots randomly
  - Send candidate solutions to robots
  - Evaluate fitness
  - Return fitness

Pso.c

- **Pso()**
  - Initialize swarm
  - For each iteration
    - Move particles
    - Evaluate particles
  - Return best particle

Obs_con.c

- **Main()**
  - Initialize robot
  - Receive weights from supervisor
  - Run controller with weights
  - Send sensor data to supervisor
Notes and Clarifications

• Please fill in the Feedback Forms on Moodle
• The performances for robotic learning are printed in the console of Webots
• The differences in performance among GA and PSO is quite small; you may need to do additional runs if the trend isn’t initially clear