Project: Nevo

Teaching Multi-Robot Behaviors with Genetic Algorithms

Shane Kelly, Kevin Zhang, David Zhu

Genetic Algorithms 101

EVALUATE

A heuristic is developed that quantifies how well each organism in a generation completed the task, creating a hierarchy where some are more fit than others.

SIMULATE

A generation of organisms attempts to complete a task, where the success of each organism is determined by its specific genes.

EVOLVE

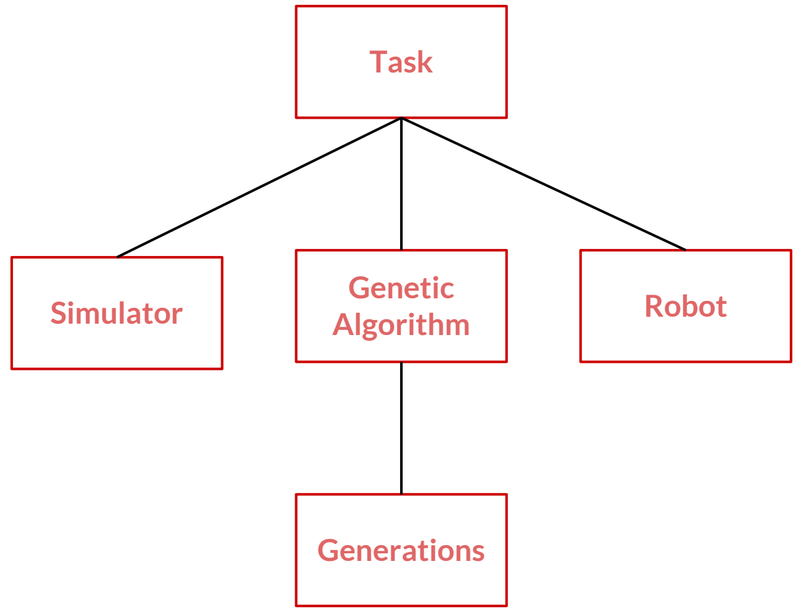
A new generation is created from the old generation, where the genes of more fit organisms are more likely to move on to the new generation.

TERMINATE

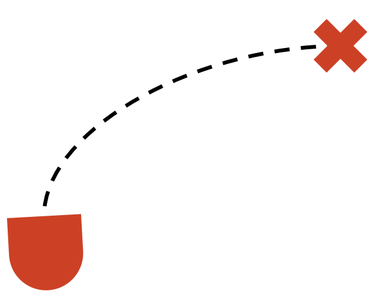
After many generations, the most fit organism will appear through evolution. This organism holds the set of genes that can best complete the task.

Project: Nevo explores the field of genetic algorithms and applies them to multiple robots in an attempt to complete a given task. By using a learning approach similar to natural selection in nature, robots can evolve to become more optimized cooperating or competing towards a particular objective.

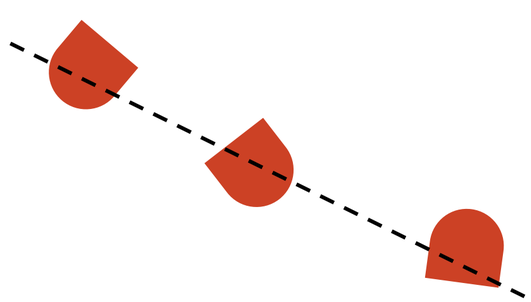
System Architecture



Navigate to Waypoint



Form a Line



Play Tag