

Autonomous Learning through Evolutionary Robotics

Abstract

Evolutionary Robotics is a nascent field in the domain of Artificial Intelligence. This project focuses on the evolutionary development of a real, neural network driven mobile robot. The evolutionary process takes place in a simulated environment and then is transferred to a real mobile robot. The neural controllers of the evolved best individuals display a full exploitation of non-linear and recurrent connections that make them more efficient than analogous man-designed agents. Furthermore, the focus is on the evolution of the adaptive rules for each neuron of the controller than the synaptic weights. The connections thus use these rules to adapt their strength online starting from random values, thus increasing robustness.