Self-Learning Robotic Arthropod

Caprita, Radu-Bogdan (School: Colegiul National "Gheorghe Lazar" Sibiu)
Dumitru, Razvan-Gabriel (School: Colegiul National "Gheorghe Lazar" Sibiu)
Hertoiu, Alin (School: Colegiul National "Gheorghe Lazar" Sibiu)

Purpose: Studying the evolution of simple creatures is key in order to unlock new knowledge. This could help us create genetic algorithms that allow robots to learn new techniques on the fly without needing help from humans. For example it could develop new walking algorithms if it has been damaged or if it encountered a new environment. Procedure: We've designed a robotic arthropod which has 3 servos on each leg for a total of 18 servos (6 legs). It is made so that it resembles a real arthropod in order to be able to learn just like an existing living creature. We've allowed it to learn how to walk both inside and outside of the house. Results: With our current constants and algorithm we've gone from a decent movement in 360000 iterations to a decent movement after roughly 1000 iterations, which equates to less than 3 hours of learning for a decent movement regardless how harsh the conditions may be. We plan to improve this greatly in the future. Conclusions: So far we've concluded that using genetic algorithms on the fly may be a viable choice in the future. The combination of both neural networks and genetic algorithms may be an even better choice in the future as it'll be able to choose when and what to learn all by itself.

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