Research of Swarm Intelligence Simulation with the Help of NXT Robots

Attila Pásztor

Nowadays a „relatively" new scientific research field of Artificial Intelligence is the SWARM INTELLIGENCE. Several researchers study the attitudes and habits of the animals that live in colony in the wild and researchers try to adopt their notes into robot groups. In order to reach a kind of goal the autonomous robots change into a multi agent system, they communicate and cooperate with each other like the animals.

This article is about how we got from the simple programmable mobile robots communicating tasks to the simulation of robots which imitating some animals' food collecting habits at the Kecskemét College faculty of GAMF at the department of Information Technology. In this experiment we used the food collecting habits of the African Desert Ants'. With the help of simple NXT robots in a simulated area the robots as a group collect objects (foods). They communicate with each other via blue tooth and use some sensors (touch, light and ultrasonic) to do the task. The first robot examines the territory and memorizes coordinates of the objects then returns back to the „anthill" and gives them the coordinates. After that the robots then convert the Descartes coordinates into Polar ones and start to the right directions. The robots fulfil the tasks together rapidly and more effectively.

This simulation is the first step in the series of possible projects. Improving new sensors and perfect communicating channels more and more robot colonies can be step up. These researches can be starting points of solving many problems or tasks, for example rescue humans and objects from polluted areas or solve collective cartographic issues.

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