Collaborative Box Pushing by Swarms of Homogeneous Robots

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Abstract

Multi-robot systems in everyday use are the next big thing of the future. Division of workload is a very basic field of research in these type of systems that have many agents working together. This very basic phenomenon of load distribution is seen in many living organisms in the world, such as, ants, honey bees, termites, etc. When they are annoyed or disturbed by an internal or external factors, they show attractive abilities to distribute errors in order to counter the situation. Using these examples from nature, we can design new systems and build a framework that can handle complex real world issues by division of workload. This projects aim is to look at how swarms of homogeneous robots collaboratively carry out a task. The project is about a group of robots that can push a box while staying together in a flock. They will be able to detect obstacles in front of them and get past them. They will also be able to detect whether the obstacle in front of them is a robot or not. The main objective of this project is the distribution of workload among small homogeneous robots to execute a specific task, which is to push a box that is heavy enough for a single robot to push. In the near future, this project will help researchers to know more about swarm behavior and the allotment of task between multi-agent systems.