

ABSTRACT

EFFICIENT ROBOT SWARM MOVEMENT AND SHAPE RECOGNITION ALGORITHMS IN ENVIRONMENTS WITH OBSTACLES

A group of robots working together to achieve a common goal is called a robot swarm. The use of robot swarms for achieving tasks is a topic of great interest because it has many advantages such as increased robustness and increased efficiency. For a decentralized swarm to work efficiently, proper communication amongst the members is required. Therefore, constant efforts are being made to find ways of improving swarm communication so that it consumes less power and takes less time thereby reducing the communication overhead.

The handling of obstacles by a swarm is one such issue that needs to be addressed. We present a scenario wherein the obstacle is really big, such as a building or a big vehicle and the robots in the swarm are assigned the task of surrounding the obstacle and then transmitting their coordinates to a remote server which can then carry out shape recognition processes based on the coordinates that have been transmitted. In our algorithm, we suggest new ways for swarm behavior so that the task is completed fast and less power is consumed. We have ensured that less power will be consumed by reducing the number of broadcast messages. Also, we have ensured that the connectivity of the swarm does not break after it starts moving along the obstacle's boundaries.

Anamika Lal
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