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The initial investigation of the design and energy sharing algorithm using two-ways communication mechanism for swarm robotic systems (Conference Paper)

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Abstract

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Swarm Robotics (SR) is a new field of study that is mainly concerned with con-trolling and coordinating a multiple small robots. SR has several key characteristics that make it a preferable choice for a variety of tasks. The characteristics include lower cost, easiness to program, scalability of tasks and fault tolerance. The robustness from fault tolerance in SR comes from having a group of small robots working on the same task and thus enabling them to tolerate the loss of a few members of the swarm as the other members can still continue with the mission. However it has shown that continuous failure of members of a swarm such as those due to low energy have a significant impact on the overall performance of the swarm. In addition, the possibility of completion of the task is also dependent on the percentage of the swarm falling out of the group due insufficient energy. Some of the work that has been proposed by the researchers is by adding a charging station or a removable charger. However, these techniques have their own limitations. Therefore a work on having the robot(s) to charger themselves without the help of the charging station or a removable charger is proposed. But the work is only proven successful in simulation without a proper design and testing in a real robots scenario. This paper is therefore will describe our initial investigation on the design and the implementation of energy sharing algorithm using two-ways robotic swarm communication mechanism with NRF2401. © Springer International Publishing Switzerland 2015.

Indexed keywords

Engineering controlled terms: Algorithms, Artificial intelligence, Fault tolerance, Information systems, Robotics, Robots

Charging station
Communication mechanisms
Energy sharings
Key characteristics
Proper design
Robotic swarms
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Back to results | 1 of 1 Top of page