

Implementing Swarm Robotics for Transferring the Object to the Destination

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Abstract: Swarm Robotics is an approach used to make the use of the robots efficiently and also intelligently. This approach helps to perform the task more effectively. These robots are firstly activated by the computer which has the control of it then the further work is done by the robots automatically. Features like scalability, robustness, etc. makes the swarm robotics flexible in various environments or conditions. In some conditions single robot cannot work effectively alone so, to help it the concept of swarm robotics was developed which is bio-inspired process. The automation in the system makes the system much better than others. In this proposed system we use Artificial Intelligence (AI) and Internet of Things (IoT).

Keywords: Swarm Robotics

1. Introduction

Self-organizing multiple robot system is the automated system which requires less human involvement. This makes the system more independent. There have been many solutions proposed such as Lloyd's algorithm which is not enough to be implemented on swarm robotics. So, we have to design such an algorithm which effectively works in any environment. Algorithm should be developed such that it binds group of robots to perform different formation on the specified area. There is a server present which controls the bots through the system calls or the functions. The server gives instruction to the robots to perform the particular tasks allocated to it. The object is detected by the bot with the help of the sensor fitted into it. It tries to move the object, if the is lighter in weight then it can be moved easily. But if the object cannot be moved by the bot then

the bot gives the command or message which activates another bot. The activated bot comes to specified location and helps it move the object to the specified location.

2. Literature Analysis

Literature analysis contains the previous papers which are references to our paper. The different papers are collected by us which are regarding our paper. These papers will be very helpful for us. These papers are compared in the table below.

3. Existing System

The existing system consists only of a single robot which moves the object. This single bot is only able to move the object which has minimum weight or we can say that the weight whose limit has been set. The robot can move the object only between the ranges provided within it.

A. Drawbacks

1. We cannot run multiple tasks at a time i.e. at an instance we can perform only one task.
2. If the task is not completed by the single bot or it is not able to move the object from the specified location, then at that time we have to increase the capacity of that robot to move the object.

4. Proposed System

The system proposed by us overcomes the maximum drawbacks of the existing system. In the existing system we are

Table 1
 Comparison of different literature papers available

S. No.	Author Name	Title	Year	Description
1	Farshad Arvin, John C. Murray, Licheng Shi, Chun Zhang and Shigang Yueli	Development of an Autonomous Micro Robot for Swarm Robotics	2014	Robot swarm is an interesting concept to provide a robust robotics system by exploiting large numbers of identical robots. Swarm algorithms are mostly inspired from social behaviour of insects and other animals. This concept allows coordination of simple physical robots to cooperatively perform tasks.
2	Yara Khaluf, Emi Mathews, Franz J. Rammig	Self-organized Cooperation in Swarm Robotics	2011	In a kind of cooperation in terms of physical connections is exploited to pass a large gap impossible for one robot to be done. Another example of physical cooperation among swarm robots is used for object transportation tasks.
3	Anmin Zhu, Simon X. Yang	An Improved SOM-based Approach to Dynamic Task Assignment of Multi-robots	2010	The proposed approach includes two parts. One is path planner, which assigns desired robots to different task locations according to dynamic situations. Because the planned path is not smooth enough after the path planner, a path tracker is applied.

using two to three robots which will communicate among themselves such that, if a condition occurs where a single robot cannot move the object then the robot will send the message to the another robot for help. Then the robot will come to help. The second will help the first robot to push the object. It will push the object to the specified location.

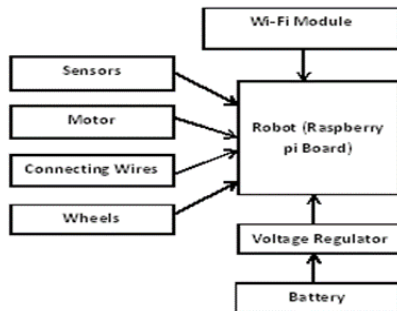


Fig. 2. Proposed system

5. Conclusion

Here, in this report we have discussed about the applications of the robots for transferring the object to the specific destination. With the help of swarm robotics, we are moving the object from one location to another. We use more than one robot to transfer the object when needed. This makes the work easier. It requires less human efforts which is the key point of the system. It is semi-automated system which means human just need to activate the robot further tasks such as moving object, communicating with other robots is done automatically.

6. Future work

This system is scalable. In future we can build powerful robots which will have latest and advanced features that will help to increase the performance. These robots can be used in

military applications, parceling industry, etc. Theses robots can be also used in the warehouses for transferring the goods which are having heavy weights. This system will be very useful in future as it is automated and by making some changes it will make the human efforts much lesser.

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