

ROBOTS KIN-SHIPED THROUGH ZIGBEE

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Abstract— Swarm robotics is based on robot's system which consist of group of simple robots which draws inspiration from swarm-intelligence and social insects. All the robots work cooperatively towards one goal. Swarm based system is used by bunch of robots to handle the given task that focuses on multiple issues with the help of group of robots and tasks, under different environment conditions subject to Uncertainties. It controls a bunch of Mobile robots which work parallel to achieve different tasks. In this project, the robot motion is integrated with task assignments, Thus robots moves once a particular task has been given to it. The group of mobile robots can automatically arrange the given task and themselves as per the environment. This system is very flexible as robots can be added or changed as per the requirements. Direction of each and every robot is taken into consideration during the planning of motion of robots. The effectiveness and efficiency of the proposed project are demonstrated by simulation studies. It is used for the tasks which demands miniaturization or that requires large space and time and are dangerous to human being like distributed sensing task in micro machinery, military applications etc. Swarm systems are adaptable as they can adjust to new stimuli or can change beyond a narrow range.

Keywords— ARM, robot, RFID, load, IR.

I. INTRODUCTION

Manipulation and controlling of object is one of the important robotic topics which attracts multiple robotic communities. Many researchers have worked using small bunch of workers to achieve the task. These methods are dependent on the number of robots involved. Previously complicated algorithms and different complex methods of co-ordination were involved. Further much larger amount of robots were used for completing a task leading to a system which was fault tolerant but complexity increased. Various techniques were introduced to reduce the complexity of the above mentioned types of systems. A system with a simple algorithm was later evolved. An aspect of object moving was introduced and problem of complexity was reduced. A gripping algorithm is proposed to trap or catch the object in a group of robots and the object is moved. Using multiple robots have been of a great interest in robotics field. Concepts such as social insects, birds and fish helps designing swarm and intelligence systems in robotics. This idea is utilized by Artificial Intelligence to build systems, which includes many autonomous robots. It achieves a particular task without the need of an authority or any sort of detailed communication. Each part of the system checks the state of its surrounding environment and responds accordingly with actions. Making use of such actions in these systems results to a simple approach as compared to multiple robot systems. These characteristics makes the system suitable for tasks that require robustness and flexibility. These systems are redundant while performing a task. In these systems the heavy objects can be pulled with the help of multiple robots easily

II. PROJECT SCOPE

- Speech Recognition.
- Vehicle Routing.
- Engine Maintenance.
- Telecommunications.
- Medical

III. METHODOLOGY

This project is designed in such way that it can be used by medium or small scale industries. In this project we are using ARM as our processor. We are using LPC293D as it supports two UART, one for communication and other for RFID. It also consists of inbuilt ADC (Analog to Digital Converter). Two sensors are being used 1) RFID sensor 2) IR sensor as input of the system. All of these parts are used to build both of the robots. The robots are classified in to two categories: 1) Master Robot 2) Slave Robot When a product arrives in the industry the Master Robot will move towards the product with the help of IR sensors. IR sensors lets the robots to decide their routes. The Master Robot then will scan the RFID tag with the help of RFID sensors. Based on the information obtained from RFID tags, ARM processes information and generates the output and communicates with other robots using ZigBee. If the weight exceeds the master robots capacity it calls the slave robot, for shifting the products. It will help in reducing human efforts and it will be less time consuming and will be more efficient. It can also be used in loading and unloading the toxic products which are otherwise dangerous for humans.

IV. LITERATURE SURVEY

The study of robotics have gone up. We go for Robotics when it comes for dangerous or inaccessible working areas. swarm robotics is widely used in:

- 1) population scaling
- 2) Tasks requiring redundancy

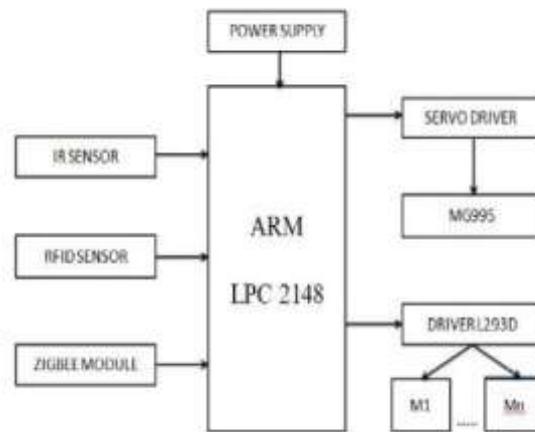
Designs provided by various projects these days are Swarm-bots project: Our objective is to design products which are self-sufficient Project SI: In this project we have algorithms inspired by swarm which control mobile robots. These robots can be re-configured communication protocols and sensors. They are adorable...Sambots: It is a project of self-assembly robots. They form new structures through self-reconfiguration and assembly.

V. PROBLEM STATEMENT

To implement a system using the swarmbots which will be useful in the industries to carry the load and transport it autonomously to the destination by communicating with the other robots

VI. SYSTEM ARCHITECTURE

The figure below is the system architecture of our proposed system it consists of the elements described in the figure below



VII. CONCLUSION

The concept of swarm robotics can be successfully implemented, for lifting the object with the help of multiple robots. In our project we took two robots to pick and place the object from one destination to another. The robots are equipped with two sensors RFID and infrared sensor.

1. RFID sensors is used to get the information of the load (weight of the object in our case)

2. Infrared sensors are used to give direction to robots.

If the weight of the object is within the limits of robot1, it will lift the object and drop it to the destination. If not, it will communicate with robot2 through ZigBee module.

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