Design and Implementation of swarm Robots

Mr.Shaikh Arshad Habib[1], Mr. Daphale Dinesh Dilip[2], Mr. Raut Annasaheb Dnyandeo[3]
[1, 2, 3] Dept of E&TC
[1, 2, 3] SKNCOE, Pune-411041, India

Abstract- *Swarm Robotics (SR) is a term applied to robots inspired by self-organizing behaviour observed in mostly insects referred to as Swarm Intelligence (SI). SR deals with co-ordinating a large number of bodies with the help of predefined local rules thereby eliminating the bottleneck operation usually seen in multi-body operating system. It deals with design of numerous simple robots which can be governed by a set of predefined conditions.*

Keywords- Swarm Intelligence, multi-robot system, local rules.

I. INTRODUCTION

The term "Swarm Intelligence" refers to sophisticated collective behavior that can emerge from the combination of many simple individuals, each operating autonomously [1]. According to Ying T [1]phones has witnessed a rapid increase. Developments in communication technologies have led tothe growth of dense networks. As a means of communication, notice boards are widely popular, with its applications ranging from schools, colleges, hospitals to major organizations. Notice boards effectively tackle the global problem of deforestation by conveying messages at large without the use of paper. Such innovative measures will go a long way in regulating the damage to the environment. GSM technology aims toreduce the complexity in sending a message by incorporating SMS (Short Message Service) technology. This technology can be put to use in public areas such as hospitals, schools, multiplexes and buildings to enhance the security system and also to spread awareness in an emergency. The objective of this paper is to review the various proposals and technologies of a SMS controlled wireless display boardwhich may eventually substitute the presently used paper based and programmable notice boards.

Design

The main aim of the project is to create multi-body robotic system that operate completely in synchronized in real time which would interact using local rules shared via a transmitting protocol. It is proposed to design a robot as a governing body (Master) and the rest small agents (Slave). The Master has been given some prerequisite conditions based on these input commands received from the sensor the Master will generate some status on its output pins at the same instant of time the Master will also transmit some characters based on the conditions and aforementioned characters are being received by the Slave, the Slave then based on the received conditions the Slave will also perform either generate the same status on its output pins or other based on the application and hence thereby achieving real time synchronization.

II. BLOCK DIAGRAM
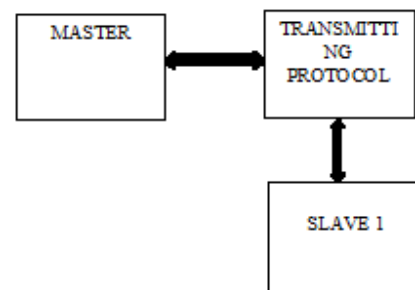
III. HARDWARE

Components required for the project are:
- Microcontroller
- Trans receiver module
- Power Supply
- Proximity Sensors

IV. BLOCK DIAGRAM DESCRIPTION

Here we are designing two interactive system that could interact among themselves and complete a specified task through UART port pins of microcontroller, the Master would generate some character based on the input received from the sensors. The characters then transmitted via UART pins would then be received by the receiver present on the corresponding slave.

The Microcontroller reads the characters received from the trans receiver module at the Slave and carries out the following

- Is character received? Yes, Read the character from trans receiver

- Store the character in Microcontroller internal memory (RAM).
- Generate status on port pins of microcontroller based on the character received.

Microcontroller: It takes input from the sensors and generates some condition and transmits the characters at Master's end and decode at the same at receiver or Slave.

Trans receiver: It is a module present on the Master as well as on receiver that could transmit as well as receive character at both the end and provide it for processing .

Proximity sensor: These are the sensors that could sense any obstacle in surrounding and could give it further to microcontroller for processing

Power Supply: it is a simple power supply that would meet microcontrollers demand.

V. ADVANTAGES

1. These concept or hardware can be used in places where it is dangerous for human bodies to work and hence limiting the risk on human bodies
2. As a number of agents are used it would provide a higher throughput and efficiency.

VI. APPLICATIONS

- Swarm robotics can be applied to almost every domain wherein it is hazardous for human body to work in the working condition like farming, fire-fighting, mining.

VII. CONCLUSION

As the technology is advancing every day the display board systems are moving from Normal hand writing display to

REFERENCES

[1] Ying T. 2013. Swarm Robotics: Collective Behavior Inspired by Nature. J Comput Sci Syst Biol. (2013), DOI= http://dx.doi.org/10.4172/jcsb.1000e106.

[2] Amanda J.C.S. 2007. Swarm Robotics and minimalism. Connection Science. 19(3), 2017. 245-260.

[3] William A. 2003. Modeling Artificial, Mobile Swarm Systems. Doctoral Thesis. Institute of Technology, California.

[4] Belkacem Khaldi, Foudil Cherif ,Department of Computer Science. LESIA Laboratory,University of Biskra, Algeria.