

Progress Presentation-I

e-Yantra Summer Internship-2016
Distributed Robotics - Multi Swarm Robots

Chinmay C
R Hariharan

Mentors:

Ms. Rutuja and Ms. Deepa

IIT Bombay

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Overview of Project

Progress
Presentation-I

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R Hariharan
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Overview of
Project

Overview of Task

Task Accomplished

Basic Design of
Minibot

PCB Design and
Schematics

Challenges Faced

Future Plans

Thank You

■ Project Name

- Distributed Robotics - Multi Swarm Robots

■ Objective

- **Bulid minibots** which have capabilities to sense its surrounding and communicate with its neighbouring robots
- **Shape formation** using the minibots

■ Deliverables

- **Five Minibots** that can portray swarm behaviours
- Implement/Develop an **algorithm** to form shapes using the robots

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TASK	DAYS
Study the concepts of swarm robotics and get familiar with different robots available	3
Make the Minibots:	
Study the kinematics of differential drive configuration	3
Select appropriate sensors to be added:	3
Design the pcbs	3
Assemble all the components	4
Test the robots	3
Solve rendezvous problem using homogenous controller gain	2
Solve rendezvous problem using heterogenous controller gain	2
Shape formation	4
Documentation	5

Task Accomplished

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- Understanding the fundamentals of swarm robotics
- Learning motion kinematics and inverse kinematics for mapping distance and angle to the position
- Designing PCB:
 - Components and shape (8cm dia) finalization
 - Understanding eagle software
 - Designing schematics
 - Placing parts in PCB layout
 - Routing the PCB, generating Bill of materials and gerber files
 - Finalizing PCB design
- Solved rendezvous problem using Firebird V robots
- Developed an algorithm for line formation by swarm robots

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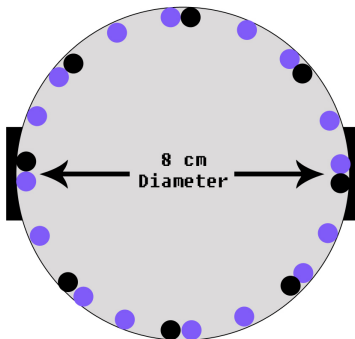
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BASIC DESIGN OF MINIBOT



● - IR Receivers

● - IR Transmitters

PCB Design and Schematic

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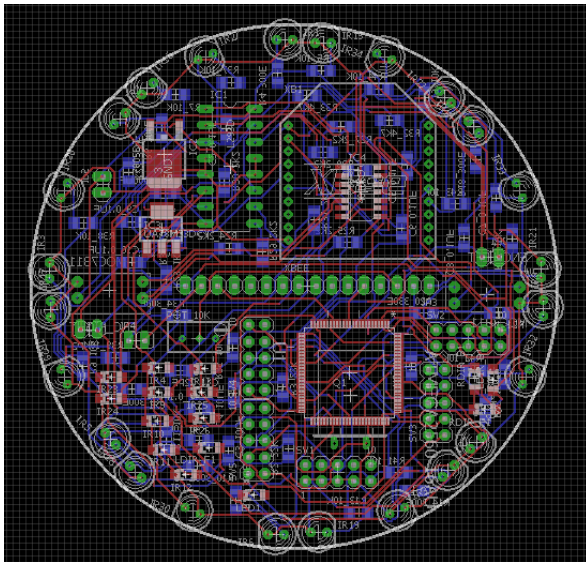
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- Miniaturizing the design of minirobot
- Designing of PCB with the constraints in size
- Routing double layered PCB
- Mapping IR reading to actual distances
- Designing line formation algorithm with respect to relative positions of robots

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- Desinging and building chassis for the minibots
- Printing of PCB and soldering parts
- Reading on already existing shape forming algorithms in swarm robots
- Developing an algorithm for forming regular shapes
- Further implementing the same for alphabets

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THANK YOU !!!