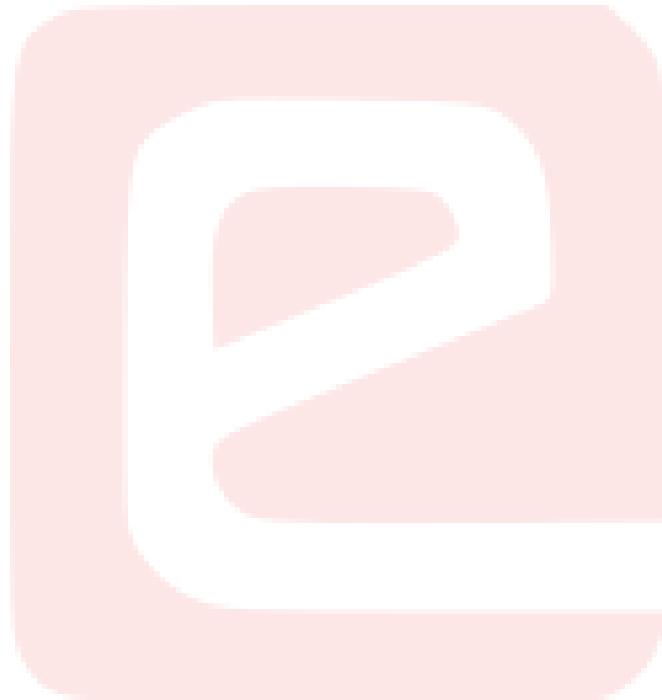


eYSIP2017

DISTRIBUTED ROBOTICS, MULTI SWARM ROBOTS



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Project Name

Abstract

Swarm robotics is an approach to the coordination of multirobot systems which consist of large numbers of mostly simple physical robots. It is supposed that a desired collective behavior emerges from the interactions between the robots and interactions of robots with the environment. This approach emerged on the field of artificial swarm intelligence, as well as the biological studies of insects, ants and other fields in nature, where swarm behaviour occurs.

Following points are completed:

- Study the concepts of swarm robotics and get familiar with different robots available
- Study the kinematics of differential drive configuration
- Selecting appropriate sensors to be added
- Designing the pcbs
- Assembling all the components
- Making of Minibots
- Testing of robots



1.1. HARDWARE PARTS

- Solve rendezvous problem using homogenous controller gain
- Solve rendezvous problem using heterogenous controller gain

1.1 Hardware parts

- List of hardware: [COMPONENT LIST](#),
- Detail of each hardware: [Datasheet](#), [Vendor link](#),
- Connection diagram

1.2 Software used

- List of softwares used are V-rep, Fusion 360, AvrDude, Avrgcc, Texstudio, Git
- Details of software: V-rep: 3.4.0, [download link](#),
- Installation steps [download link](#),
- Details of software: Fusion 360: 3.4.0, [download link](#),
- Installation steps [download link](#),
- Details of software: AvrDude, [download link](#),
- Details of software: Avrgcc, [download link](#),
- Details of software: texstudio, [download link](#),
- Installation steps [download link](#),
- Details of software: git, [download link](#),
- Installation steps [download link](#),

1.3 Assembly of hardware

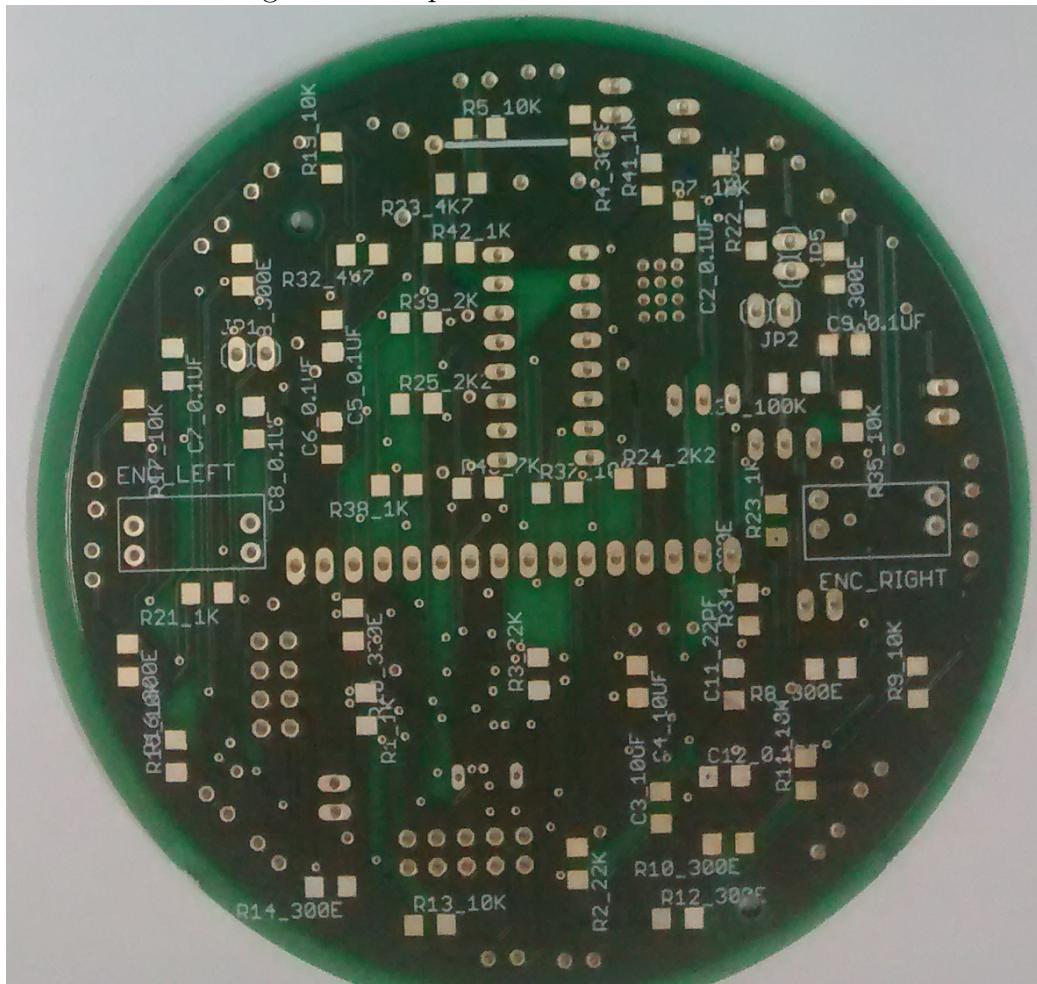
Circuit diagram and Steps of assembly of hardware with pictures for each step

1.3. ASSEMBLY OF HARDWARE

Circuit Diagram

Circuit schematic, simplified circuit diagram , block diagram of system

Figure 1.1: A picture of the swarm robots!



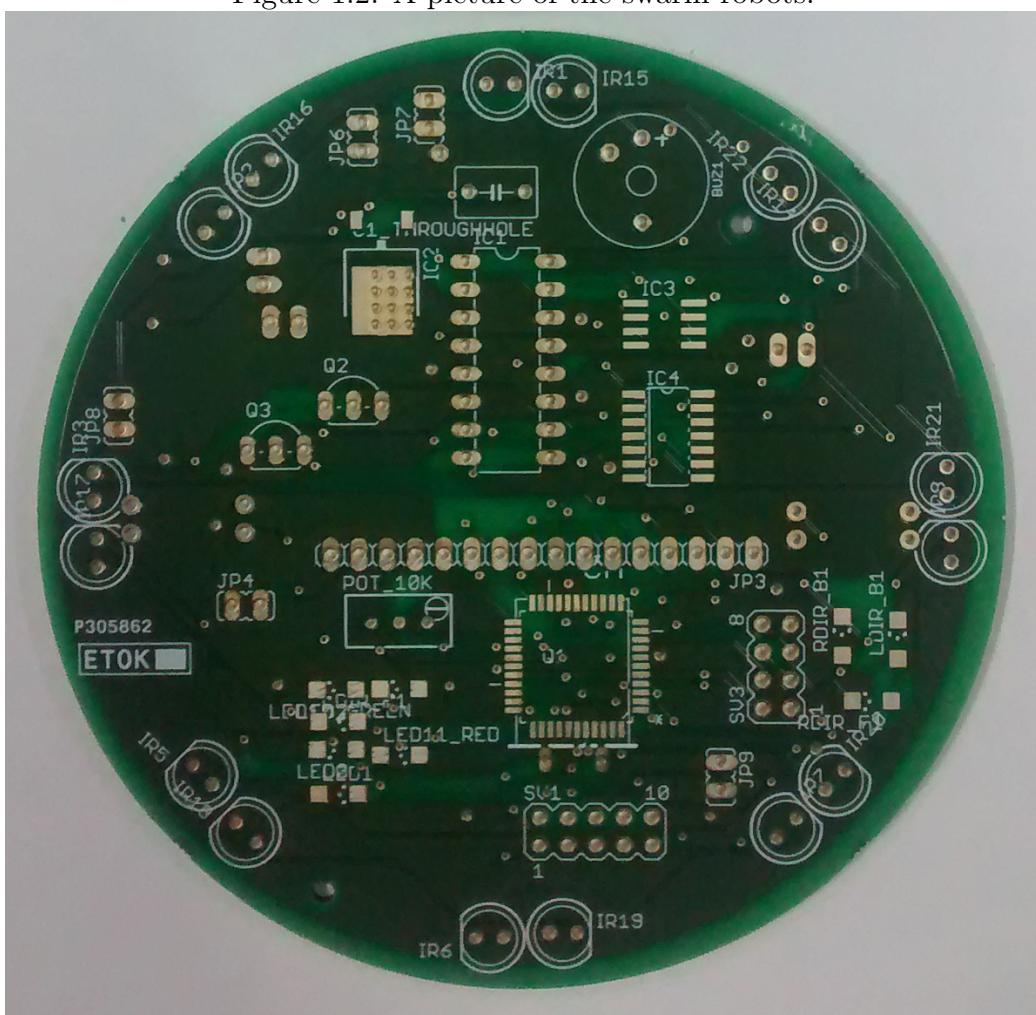
Step 1

Steps for assembling part 1



1.3. ASSEMBLY OF HARDWARE

Figure 1.2: A picture of the swarm robots!



Step 2

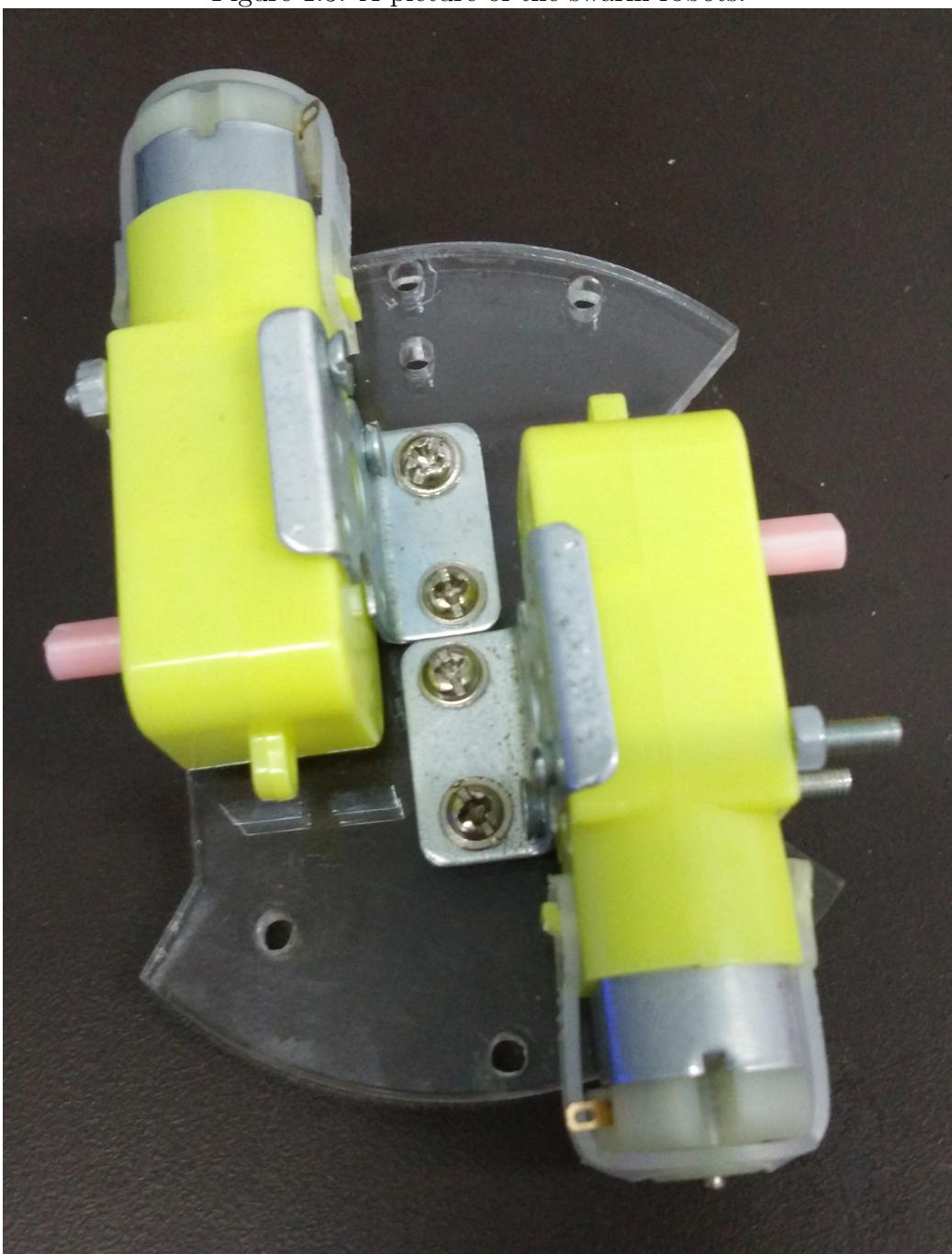
Steps for assembling part 2

Step 3

Steps for assembling part 3

1.4. SOFTWARE AND CODE

Figure 1.3: A picture of the swarm robots!

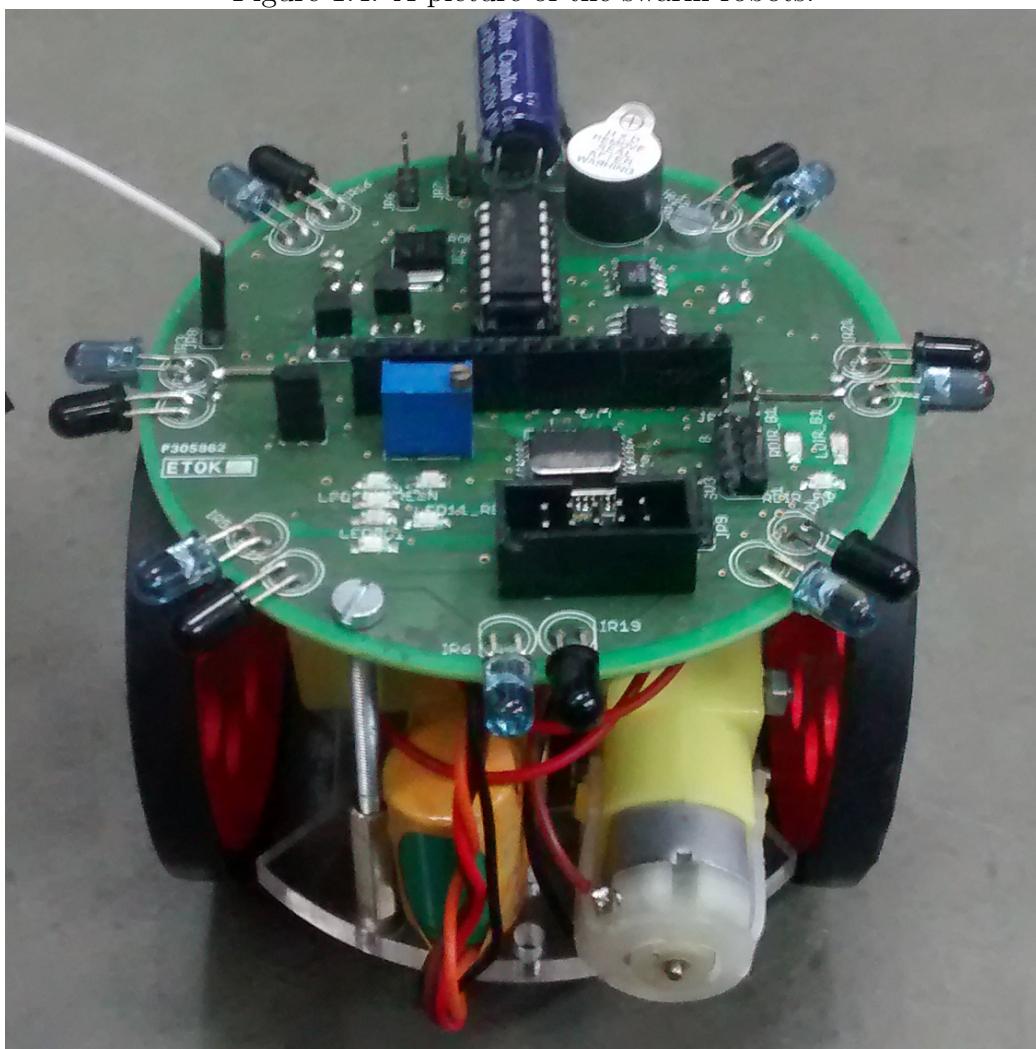


1.4 Software and Code

[Github link](#) for the repository of code

1.5. USE AND DEMO

Figure 1.4: A picture of the swarm robots!



Brief explanation of various parts of code

1.5 Use and Demo

Final Setup Image

User Instruction for demonstration

[Youtube Link](#) of demonstration video

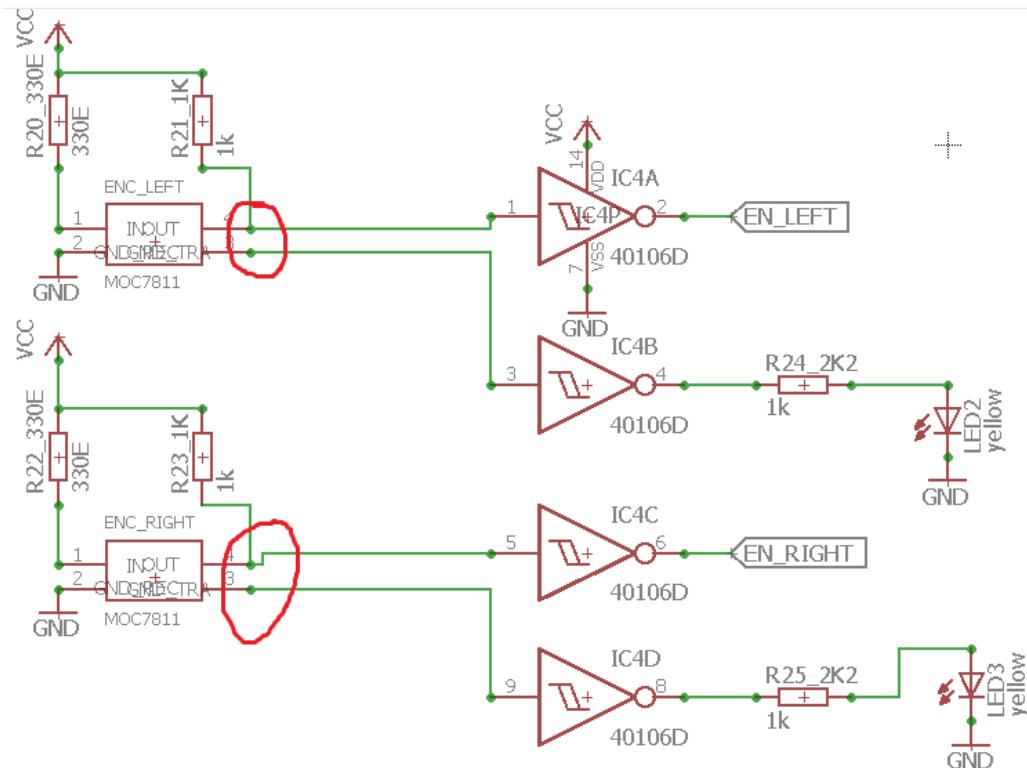


1.6. FUTURE WORK

1.6 Future Work

What can be done to take this work ahead in future as projects.

1.7 Bug report and Challenges



Pin 3 of both encoders was supposed to be shorted to ground and connection to buffer connected to buffer was supposed to be shorted to pin 4. Any failure or challenges faced during project

Bibliography

- [1] Ayan Dutta, Sruti Gan Chaudhuri, Suparno Datta and Krishnendu Mukhopadhyaya, *Circle formation by asynchronous fat robots with limited visibility*
- [2] Sruti Gan Chaudhuri and Krishnendu Mukhopadhyaya, *Gathering Asynchronous Transparent Fat Robots*
- [3] Ayan Dutta, Sruti Gan Chaudhuri, Suparno Datta and Krishnendu Mukhopadhyaya, *Circle formation by asynchronous fat robots*
- [4] Swapnil Ghike and Krishnendu Mukhopadhyaya, *A distributed algorithm for pattern formation by autonomous robots, with no agreement on coordinate compass*
- [5] Avik Chatterjee, Sruti Gan Chaudhuri, Krishnendu Mukhopadhyaya, *Gathering asynchronous swarm robots under non uniform limited visibilities*
- [6] Krishnendu Mukhopadhyaya, *Distributed swarm robotics for swarm robots*