Swarm Robotics

Aim: **to implement formation control in Swarm Robotics.**

Introduction: **Swarm robotics is an approach to the coordination of**[**multirobot systems**](https://en.wikipedia.org/w/index.php?title=Multirobot_system&action=edit&redlink=1)**which consist of large numbers of mostly simple physical**[**robots**](https://en.wikipedia.org/wiki/Robot)**. It is supposed that a desired**[**collective behaviour**](https://en.wikipedia.org/wiki/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**](https://en.wikipedia.org/w/index.php?title=Artificial_swarm_intelligence&action=edit&redlink=1)**, as well as the biological studies of insects, ants and other fields in nature, where**[**swarm behaviour**](https://en.wikipedia.org/wiki/Swarm_behaviour)**occurs.**

Theory: **Formation control is a coordinated control for a fleet of robots to follow a predefined trajectory while maintaining a desired spatial pattern. We have implemented formation control on Firebird V owned by Jadavpur University. Fire Bird V will help you get acquainted with the world of robotics and embedded systems. Thanks to its innovative architecture and adoption of the ‘Open Source Philosophy’ in its software and hardware design, you will be able to create and contribute too, complex applications that run on this platform, helping you acquire expertise as you spend more time with them. Fire Bird V is designed by NEX Robotics and Embedded Real-Time Systems lab, CSE IIT Bombay. Firebird V has two micro controllers -Atmega 2560 as master microcontroller and Atmega 8 as Slave microcontroller.**

**We have used six firebird V to exhibit formation control. The algorithm is designed in such a fashion that the bots will form a triangular shape and all the bots will showcase same movements and same pattern respectively.**

Conclusion: **This is our first approach towards swarm robotics. We are planning to modify the algorithm to get better results.**