**Students’ Placement Office, IIT Kanpur**

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| **Title of the Project** | Swarm Robotics |
| **Commencement Date** | May 2019 |
| **Completion Date** | July 2019 |
| **Project Supervisor** | Dr. Soumya Ranjan Sahoo |
| **Organization/Institution where the Project was accomplished** | IIT Kanpur |
| **Project Description** (You can use extra A4 sheets in case you run out of space however the extra sheets should also have the seal & signature of the Project Supervisor or the relevant authority ) | |
| * Project Overview :This Swarm was a group of ground robots navigating in an unknown environment by localizing themselves and coordinating with each other to complete the specified task. * Design & Fabrication : Designed the complete model of swarm robots on AutoDesk Inventor and then fabricated the model. * Controls :   - Design a full-fledged controller for Omni directional robots.  - Find the system parameters and then transfer function by plotting characteristics of the motor.  - Use the PID algorithm to correct the error.   * Electronics & Communication : Designed the circuit board for the robots. Main electric components that were included in the robots were Raspberry Pi, Arduino, Inertial Measurement Unit Sensor(IMU), Ultrasonic Sensors, WiFi module, and DC Motors. Used Raspberry pi as the master processing unit of the swarm. Communication between swarms is done through the network over WiFi using SPI protocols. Each swarm member senses his environment and sends the relevant information to master from where information is manipulated and pass to the slaves. * Wrote obstacle avoidance algorithm for bot to navigate in environment. * Used ROS as a mode of communication between different nodes of sensors and actuators of the robot. | |

**Project Verification Form**

**By appending your signatures to this form you acknowledge and agree that:**

* This form along with the certificate would serve as the official document between the project supervisor and Students Placement Office, IIT Kanpur regarding verification of the student’s project work
* The student will provide additional information and documentation relevant to his/her project upon request by the Students’ Placement Office
* The student has clearly defined his/her individual role in projects done in cooperation with other students, faculty, groups or company personnel.
* Incorrectly over-stating the reach, impact and/or quantitative/qualitative results of a project is unethical.
* In case of violation of any of the above rules, Students’ Placement Office, IIT Kanpur reserves the right to take necessary action including de-registering the student from the placement season and reporting the misconduct to the Institute Authorities.

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| **Submitted by:-** | **Project Supervisor Details:-** |
| Name: Vivek Agrawal | Name: Dr. Soumya Ranjan Sahoo |
| Roll No: 170808 | Designation: Professor at Department of Electrical Engineering |
| Signature: | Signature: |