Vivek **Agrawal**

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Hall 3, IIT Kanpur, Kanpur, Uttar Pradesh, 208016, India
Born on 12 Jan. 1999 in Jaipur, India

Education

2017 - Present	Indian Institute of Technology Kanpur, B-Tech with major in **Electrical Engineering**, CPI : 8.2/10
2015 - 16	Creative Public Senior Secondary School, Class XII, Percentage : 83.40%
2013 - 14	Creative Public Senior Secondary School, Class X, Percentage : 90.83%

Skill-sets

Programming Language	C, C++, Python, R, HTML, CSS
Python Libraries	Opencv, Robot Operating System (ROS), Numpy, Matplotlib, Scipy
Deep Learning Frameworks	Pytorch, Tensorflow, Keras
Tools and Softwares	Matlab, Gazebo, AutoCad, Arduino, Autodesk Inventor, GNU-Octave, Git, LaTeX, Linux(Ubuntu)
Operating Systems	Linux(Ubuntu), Windows, Raspbian

Academic Projects

May 2019 – Jul. 2019 | **Shared Autonomy via Deep Reinforcement Learning and Formal Methods**, IIT Kanpur
SURGE Intern, *Advisor* : Prof. Indranil Saha (Dept. of Computer Science and Engineering)

- Worked with Astra Depth camera on Turtlebot2 to sense the environment.
- Used Gazebo for simulating Turtlebot in a real environment like situation.
- Applied **Dueling Deep Q-Learning** algorithm to train the robot for navigating in an environment without the need of any human intervention using Tensorflow library.
- Applied **Soft Actor-Critic** algorithm to train robot the with RGB image, and depth image as input, to predict a safe action for the robot using pytorch library.

Deep Reinforcement Learning | Formal Methods | Gazebo | Autonomous System

May 2019 – Jun. 2019 | **Swarm Robotics**, IIT Kanpur
Under Graduate Project, *Advisor* : Dr. Soumya Ranjan Sahoo (Dept. of Electrical Engineering)

- Created a group of autonomous robots that navigate in an environment, avoid obstacles and communicate with each other.
- Designed a controller for **Omnidirectional** robots that navigates using mecanum wheels
- Used **ROS** for communicating between different nodes of sensors and actuators of the robots.

Omnidirectional Controller | Robot Operating System (ROS) | Swarm Communication

May 2018 – Apr. 2019 | **ABU Robocon 2018 & 2019**, IIT Kanpur
Memeber, *Advisor* : Dr. Ashish Dutta (Dept. of Mechanical Engineering)

- Worked upon the **autonomous navigation** of robots using computer vision algorithms. Design an algorithm for **lane detection**, and **ball detection** and its **distance estimation** from robot.
- Designed circuit and wireless controller of robots and wrote **control algorithm** of a **4 legged** spider robot actuated with 12 servo motors.
- Modified the **Theo Jansen mechanism** for **4 legged robot**, designed the CAD model, **simulated** on **Matlab** to find optimal link lengths and made a working prototype of it.

Computer Vision | Controls | Simulation | 4 legged Robot | CAD Design | Circuit Design

Relevant Course Work

Data Structure and Algorithms	Deep Learning Specialization***	Robot Motion Planning
Machine Learning for Signal Processing**	Principles of Communications**	Partial Differential Equation*
Artificial Intelligence for Robotics***	Digital Electronics**	Control System Analysis
Probability and Statistics	Introduction to Electrical Engineering	Linear Algebra and Differential Equation

**Exceptional Performance* ***Ongoing* ****Audited*

Awards and Achievements

- All Indian Rank(AIR) 456 among 0.5 million students in JEE Advance 2017.
- All Indian Rank(AIR) 1118 Among 1.5 million students in JEE Main 2017.
- International Rank 1041, City Rank - 1st in 17th Science Olympiad 2015.

Languages

English ●●●●○
Hindi ●●●●●

Strengths

- Passionated
- Self-Motivated
- Dedicated

Extracurricular Activity

- Founder and Technical Head of Team Robocon IIT Kanpur. May 2018 - Apr. 2019.
- Secretary of Robotics Club at IIT Kanpur. May 2018 - Apr. 2019.
- Campus Ambassador, Learning While Travelling. Mar. 2018- Jun. 2019.