Vivek AGRAWAL
Third-year Undergraduate (EE)

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♦ Hall 3, IIT Kanpur, Kanpur, Uttar Pradesh, 208016, India

i 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, Verilog, VHDL
Python Libraries	Opencv, PCL, 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

🖥 EXPERIENCE

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

> Academic Excellence Award for best academic performance at IIT Kanpur in 2018
> 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

> Manager, Academics and Career Council, IIT Kanpur	May '19 - Present.
> Founder and Technical Head of Team Robocon IIT Kanpur.	May '18 - Apr.'19
> Secretary of Robotics Club at IIT Kanpur.	May '18 - Apr.'19
> Campus Ambassador, Learning While Travelling.	Mar '18- Jun '19