# Vivek **Mudgal**

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## Education

**Indian Institute of Technology Kharagpur** *Kharagpur, India*

B.Tech in Electrical Engineering *July 2015 - Exp. July 2019*

- Minor in **Computer Science and Engineering**
- Current GPA: 8.06/10.0

## Experience

**Team Indus, Axiom Research Labs Pvt. Ltd.** *Bangalore, India*

Flight Software Internship *May 2018 - June 2018*

- Engineered Fault Detection, Isolation and Recovery architecture of the spacecraft set to become the world's first privately funded lunar lander.
- Integrated autonomous fault tolerant systems such as SRAM scrubbing and EDAC traps to correct SEUs and mitigate risk of fatal hardware traps.
- Established high level on-board FDIR processes for ground intervention which included reset scenarios and configuration management.
- Formulated strategy to periodically downlink segments of multiple images of executable program and monitor their integrity.

**IIT Kharagpur** *Kharagpur, India*

Discrete Control Systems Research *May 2017 - July 2017*

- Designed and implemented a discrete time closed loop position controller for magnetic levitation of a metallic ball inside a magnetic field.
- Obtained an optimal sampling time for 5% overshoot and 25% decay ratio for better robustness and tracking compared to previous controllers.

**Technology Robotix Society** *Kharagpur, India*

Governor *March 2018 - Present*

- Spearheading a team of 45 individuals as the official group of the institute responsible for all robotics activities in and outside of the campus.
- Pioneered the launch of Makerspace Lab to provide free and open source workspace and resources for the entire student community.
- Led a 3 tier team to orchestrate Robotix'18, which witnessed participation of 600+ students from 60+ colleges with a budget of INR 0.4 million.

## Projects

**Aerial Robotics Kharagpur** *Kharagpur, India*

Professor In Charge: Dr. Somesh Kumar *March 2016 - March 2018*

- Devised navigation and control system for UAV and aerial-ground robot interaction using PID controller and various path planning algorithms.
- Architected 3 different classes of indigenous autonomous drones as test beds for robotics framework to control Unmanned Aerial Vehicles.
- Implemented and simulated an algorithm for vision-based landing of a hexacopter on or in vicinity of a mobile ground robot.
- Researched and built the simulink model of a quadrotor for PID control of its state and velocity on MATLAB to study its dynamics and control

**Hand Gesture Recognition and Tracking** *Kharagpur, India*

Professor in Charge: Dr. Alok Kanti Deb *July 2018 - Present*

- Executing a Bachelor Thesis Project in the field of computer vision aiming to make real time human-computer interactions more intuitive.
- Developing a robust marker-less hand gesture recognition system with efficient tracking aimed to replace traditional pointing devices.

**Intelligent Water Management System** *Kharagpur, India*

Professor in Charge: Sudhirkumar Barai *April 2018*

- Constructed an intelligent water management system to tackle basic faced by smart cities using neural networks and fuzzy logic.
- The integrated system could control reservoir levels, predict daily and seasonal demand, inspect and sanitize water for efficient results.
- Peer-reviewed as the second best project among a total of 13 projects.

## Honors & Awards

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| 2017 | **Most Innovative Design,** International Aerial Robotics Competition with 20 teams from 7 countries | *Beijing, China* |
| 2016 | **1st Prize,** Hardware Modelling, General Championship - Technology | *Kharagpur, India* |
| 2015 | **All India Rank 975,** JEE(Advanced), written by 1,000,000 students | *Jabalpur, India* |
| 2014 | **Head Boy,** Gyan Ganga International School | *Jabalpur, India* |

## Coursework

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| **IIT Kharagpur** | Machine Learning, Computer Architecture & Operating Systems, Image Processing, Large Scale Search Engines, Embedded Software Design and Validation, Data Analytics, Design and Analysis of Algorithms, Soft Computing, Linear Algebra, Probability and Stochastics, Transform Calculus |
| **MOOC** | Machine learning (Stanford Online), Perception (University of Pennsylvania), Applied Machine Learning in Python (University of Michigan), Control of Mobile Robots (Georgia Institute of Technology) |

## Skills

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|---|---|
| **Software** | Python, C, C++, OpenCV, MATLAB, LaTeX, ROS, Gazebo, Git, HTML |
| **Embedded Systems** | Flight Controllers, Raspberry Pi, Arduino, AVR, SPARC, EAGLE, BeagleBoard |