

NISHANT MITTAL

Electrical Engineering Undergrad at IIT Bombay

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WORK EXPERIENCE

IITB Mars Rover Team

Electrical and Hardware Subsystem

📅 June 2020 – Present

📍 IIT Bombay, India

- Aided in performing risk analysis and subsystem overview report development for ERC 2021
- Aided in providing **visuals** for the Electrical subsystem in the report for **IRDC 2020** where the team ranked **4th**
- Analysed performance of various **DC-DC converters** to select optimal converter for powering onboard circuit
- Investigated cause of NUC damage and proposed ideas to overcome over-current and current ripple effects of buck-boost converter
- Working on main **PCB design** to reduce electrical footprint and make the system more robust and shockproof

Data Science Engineering Intern

Cormentis Design Corporation, USA

📅 April 2020 – July 2020

📍 Remote

- Implemented different algorithms to **retrieve targeted data** from various platforms to cross-link web profiles
- Interfaced retrieved data with **Natural Language Processing** services to extract keywords and relevant information which was further used to implement better cross-platform linking and create an all-round profile
- Automated and deployed **data retrieval algorithms** to a backend server for integration with a front end UI

KEY PROJECTS

Digital Correlator for GPS Acquisition

SURP | Prof. Rajesh Zele

📅 May 2021 – Present

📍 IIT Bombay, India

- Developing a digital circuit using FPGA design to interface with an RF receiver and perform Data acquisition from GPS satellites for the IRNSS program
- Perform GPS tracking and obtaining C/A code and navigation data using digital circuits.
- Created software to interface with tracking hardware and estimate user location and end result

Modeling and Control of Flexibility in Manipulators

Summer Project | Prof. Ravi Banavar & Prof. José Angel Acosta

📅 March 2020 – Present

📍 University of Seville, Spain

- Modelling the Dynamics and Kinematics of interaction of a **flexible multi-link arm** with a compliant surface
- Kinematics modelled as a product of exponentials, dynamics modelled in a geometric-coordinate free approach
- % Insert control algo info
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EDUCATION

B.Tech. in Electrical Engineering

Indian Institute of Technology Bombay

📅 August 2019 – Present

CPI: 9.85

Intermediate/+2

Nalanda English Medium School

📅 2018 – 2019

Percentage: 93.40 %

Matriculation

Indira National School

📅 2010 – 2018

GPA: 10

ACADEMIC ACHIEVEMENTS

- Bagged a Department Rank of **4** in a batch of 164 students [2021]
- Received the **AP**(Advanced Performance) grade in Analog Systems, Digital Systems as well as 3 other courses [2019, 2020]
- Clinched an All India **Rank 275** in **JEE Advanced** among 0.2 million candidates [2019]
- Secured an All India **Rank 1130** in **JEE Main** among 1.6 million candidates [2019]
- Received the prestigious **KVPY** fellowship with All India Rank **266** [2018]

SKILLS

Python

VHDL

C++

LaTeX

Eagle

MATLAB

Simulink

LtSpice

Selenium

Arduino

Raspberry Pi

ESP32

OTHER PROJECTS

Control Algorithm for aLIGO

Summer Project | Dr. Suresh Doravari

📅 May 2021 – Present 📍 IUCAA, India

- Aided in modelling of the **flexibility** in the arms of **Robert Linkages** in a geometric, coordinate-free framework
- Aided in modelled and simulated single-stage, double-stage and quad-stage suspension modules for aLIGO
- Developing an MPC based algorithm to compute a control filter based on a given plant and given objectives

Lab Bench Power Supply

Course Project | Prof. Joseph John

📅 August 2019 – November 2019 📍 IIT Bombay, India

- Designed and built a power supply using the **LM7805** and **zener diodes** capable of outputting 5V and $\pm 12V$
- Recognised as one of the **top 10** teams out of **70+** for **exceptional performance** and **execution** of the task

Frequency Domain Analysis of Linear Systems

Summer Project | Controls and Dynamical Systems SRG

📅 March 2020 – May 2020 📍 IIT Bombay, India

- Worked with a team of **fifteen** to learn and deliver a report on *Frequency Domain Analysis of Linear Systems*
- Implemented various algorithms in **MATLAB** for **echo simulation** and **echo elimination** in a closed room

Spaceflight Dynamics Report

Summer Project | Maths And Physics Club

📅 April 2020 – June 2020 📍 IIT Bombay, India

- Created a report to provide a **mathematical basis**, key for the development of ideas for spaceflight and delved into the nuances of some related concepts
- Provided a small case study of the **Voyager Deep Space missions** and outlined various details about the same

Video Game Playing Artificial Intelligence

Institute Technical Summer Project

📅 February 2020 – August 2020 📍 IIT Bombay, India

- Implemented a **Double Deep Q Neural algorithm** to play video games without any prior knowledge
- Trained and tested on the Chrome Dino Game and further extended to various openAI GYM environments

Bluetooth Controlled Racing Bot

Electronics and Robotics Club

📅 August 2019 – September 2019 📍 IIT Bombay, India

- Constructed a robotic car for a racing competition using a **ATTINY2313A** the brains of the bot, an **L293D** motor driver for control and an **HC-05** Bluetooth module for wireless communication
- Successfully navigated a **10+** meter relay course with slopes, spinning platforms and blind alley **twice**

KEY COURSES

- Analog Circuits

Probability & Random Processes

Power Engineering - I

Power Engineering - II

- Digital Systems

- Microprocessors

- Control Systems

- Signals & Systems

- Mathematical Structures for Control

- Control of Non-linear Systems

CERTIFICATIONS

- Spacecraft Dynamics and Control

- Spacecraft Dynamics and Control

- Self-Driving Cars

COMPETITIONS

- Won the award for Social Responsibility at Rohde & Schwarz Engineering Competition 2021 with team SPINS

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- Won Second Place in Game Jam Titans Pune(2015), a video game design competition (The Ethical Hackers)

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- Academic mentor for the topic *Spaceflight Dynamics* as part of the Summer of Science project run by the Maths & Physics club of IIT Bombay

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- Assisted and hosted a sponsor company, Auxillo Finance, as Marketing Organizer for the E-Summit 2020.

EXTRACURRICULARS

- Volunteer for **The Art of Living** since **10+** years
- Completed a **year long** course of training in **Yoga** under **NSO** in IIT Bombay
- Active participant in local hill **rejuvenation** and **tree** plantation project

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- Avid Origamian and have created modular origami structures of **10,000+** pieces
 - Was an integral part in hosting the annual Science Fair at Indira National School