Indrajeet Mohite
Energy Science and Engineering
Indian Institute of Technology, Bombay

16D170010
Dual Degree (B.Tech. + M.Tech.)
Gender: Male
DOB: 22-07-1998

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2021	
Intermediate	HSC	Dattakala Jr. College	2016	76.15%
Matriculation	CBSE	VPEMS	2014	93.00%

*Pursuing **Minor** in the Department of **Electrical Engineering***

SCHOLASTIC ACHIEVEMENTS

- Awarded **AP** grade in Energy Systems Modelling and Analysis course for Outstanding Performance ['19]
- Recipient of **KVPY** scholarship from IISc Bangalore with **All India Rank 577** out of 50,000 candidates ['15]

INTERNATIONAL EXPERIENCE

Murata, Japan | Energy Storage System Department (ESS) [May'19 – Jul' 19]

Proposed an optimum configuration of a 1.3 MWh capacity Energy Storage System for 1200 kVA back-up

- Studied the Design concept of **Batteries** and Battery Management System (**BMS**) developed by Murata
- Designed peripheral **Low Voltage circuitry** to operate Control functions and Battery Management Hub
- Selected components like DC Circuit Breaker and Fuse to ensure **Surge current** and **Short-Circuit safety**
- Performed technical, financial **Best Value Option Analysis** among feasible Battery and BMS configurations
- Studied **Voltage vs SoC curves** at various current levels by performing Charge-Discharge tests on Batteries
- Assembled High Voltage Battery Racks and conducted **Internal Impedance tests** and various Safety checks

IIT BOMBAY RACING

Chief Electrical [May' 19 – Jul' 20]

Faculty Advisor: Prof. Amber Shrivastava, Department of Mechanical Engineering, IIT Bombay

***Led** a 4-tier cross-functional team of 70+ students to build an **electric vehicle** for **Formula Student (FS)**, an **international** student race-car design competition at **Silverstone** conducted by Institute of Mechanical Engineers*
*Ranked **4th overall** at FS UK 2020 among **73 teams** from **23 countries***

- Spearheaded the Electrical division to achieve Reliability and Serviceability of the vehicle at minimal cost
- Head of **Powertrain**, Battery Management System (**BMS**), System Integration, High & Low Voltage Safety
- Led the Powertrain Division at FS UK 2020 **Engineering Design Event**, Secured **1st** position among **73** teams
- **Design Initiatives -**
  - Achieved **10%** improvement in **Cooling** of the Battery pack and **36% faster** sensor assembly time by designing a new **cell connection technique** using PCBs instead of lower Aluminum busbars
  - Reduced the **manufacturing time** by >50% by revamping the **Wiring Harness** designing methodology
  - Incorporated Online State-of-Charge (**SoC**) estimation to monitor the Battery percentage and Cell health
- Drafted the Failure Modes and Effects Analysis (**FMEA**) document to identify the required **Risk Management**
- **Point of Contact** for interactions with in-kind sponsors – *Analog Devices, TE Connectivity, PCB Power, Bender*
- Employed Gantt Charts to manage **Timelines** and short-term **Targets** for the 20 membered Electrical team

Senior Design Engineer [May' 18 – Apr' 19]

*Won the prestigious **FS Award** worth £3000 based on overall team progress (Awarded to 8 out of 118 teams)*

- Designed a rule compliant electric unit for controlling **40 kW BLDC Motors** using 400V Battery and Inverters
- Incorporated High Voltage safety in the entire vehicle to ensure **Fail-Safe** mechanisms in critical circuitry
- Designed a **charging setup** for High Voltage Li-ion Battery incorporating BMS and Insulation Safety circuits
- Responsible for managing the summer induction program for 50+ freshmen to impart knowledge on EVs
- Conducted sessions on **Batteries** and **High Voltage Safety**, with design projects on Eagle **PCB designer**

Junior Design Engineer [May' 17 – Apr' 18]

- Contributed to designing and **debugging** of PCBs for Battery Control Unit with an exhaustive testing protocol
- Performed controlled charging and discharging of 22Ah capacity 403V Li-ion battery pack using safety tools

Research Projects

Solid-State Batteries | Dual Degree Project [May' 20 - Present]

Guide - Prof. Sagar Mitra, Dept. of Energy Science, IIT Bombay

- Studied **Ionic Conductivity**, **Interfacial Resistance** to increase the Power Density of Solid-State Batteries
- Examined various **prototyping methods** to reduce cost and improve overall performance of Batteries
- Analysed the advantages of Lithium Sulphur batteries and Hybrid batteries over conventional chemistries

State-of-Charge Estimation in Electric Vehicles | Seminar [Aug ' 19 - Nov' 19]

Guide - Prof. Sagar Mitra, Dept. of Energy Science, IIT Bombay

- Analysed the accuracy of **State-of-Charge (SoC)** measuring techniques for Batteries in **Electric Vehicles**
- Studied SoC correction techniques compatible with regression methods such as **Kalman Filter** algorithm

Academic Projects

HikeOne | Energy Innovation Lab [Aug ' 19 - Nov ' 19]

Guide - Prof. Suryanarayana Doolla & Prof. Srinivas Seethamraju, Dept. of Energy Science, IIT Bombay

*A **portable electricity solution** to reduce the need of carrying large batteries in remote areas*

- Ideated and prototyped an All-in-One portable electricity solution for defence personnel and hikers
- Integrated hydro turbine, gravity light and solar PV panels in a portable case giving constant 5V output

Transient Stability of Power System | Electrical Energy Systems [Jan ' 19 - Apr' 19]

Guide - Prof. Zakir Hussain, Dept. of Energy Science, IIT Bombay

- Studied the transient stability of a system for various faults and clearance time
- Simulated standard **IEEE 14 bus system** and studied the impact of fault location on system stability

Wireless Water-Quality Check System | Energy Engineering Fundamentals [Jan' 17 - Apr ' 17]

Guide – Prof. Rangan Banerjee, Dept. of Energy Science, IIT Bombay

- Prototyped a water-quality check system for still water bodies powered by Solar PV and NiMH cells
- Implemented a wireless interface using ESP8266 and ArduinoUNO module for **remote accessibility**
- Scrutinized the model for performance parameters like **payback period** and **life** for on-site deployment

Mentorship and Social Work

Department Academic Mentor | Energy Department, IIT Bombay [Apr ' 18 – May' 19]

- Among 10 members chosen from 35 applicants based on **overall performance**, **ethics**, and **peer review**
- Mentored 5 sophomores on their academic concerns in coordination with their faculty advisor

Techfest | IIT Bombay's Annual Technical Festival [Dec' 16]

- Volunteered for the **social initiative** Can U Really Escape Diabetes (CURED) campaign aimed at spreading awareness at 150+ centres all around Mumbai recording 35,000+ sugar level check-ups in a single day
- Registered 700+ pledges for Guinness Book for free diabetes check-up at a single booth in 10 hours

Key Courses

- Microprocessor application in Power Electronics*
- Computer Programming and Utilization
- Computer aided power system analysis
- Power Electronics
- Electrical Machines
- Control and Instrumentation

** To be completed by Nov '20*

Technical Skills & Interests

- **Languages** - C++, Python, Matlab, LATEX
- **Software** - Eagle (PCB Designing), NGspice, R-studio
- **Interests** - Electrical Design, Control
- **Hobbies** - Road Trips, Formula 1, Chess

Extra Curriculars

Sports	• Completed training in Dramatics and Volleyball as part of National Sports Organization • Represented Hostel in Crossy **General Championship**
Other	• Built a Bluetooth controlled vehicle adaptable to both land and water for ITSP • Built a Radio-controlled Airplane for a competition organized by STAB, IITB • Industry Visits – Thermax Solar Biomass Hybrid Power Plant; Tata Power Plant

Scholastic achievements and extracurricular activities are not verified by the Placement Cell