**MANISH H T**
**Energy Science and Engineering**
**Indian Institute of Technology Bombay 21D170024**
**Dual Degree (B.Tech. + M.Tech.)**
**Graduating Year : 2026**

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| Examination | University | Institute | Year | CPI / % |
|---|---|---|---|---|
| Intermediate | State Board | Alvas Pre University College | 2021 | 93.67% |
| Matriculation | ICSE | South East Asian International School | 2019 | 86.67% |

## SCHOLASTIC ACHIEVMENTS

- Secured a **Council of Europe Level B1 rank** in **FCE Exam** in Cambridge Assessment English course which builds and test us for our listening, speaking, reading and writing skills and abilities, which is offered by the **University of Cambridge** *(Apr'18)*
- Bagged a **Proficiency Rank** in **All India General Knowledge Exam** conducted by **Centre for Human Resource Development**
- Received **Merit Rank** in **Vedic Maths and Abacus competition** which was held by **Brain Shine Edu-Care** Bangalore *(Apr'15)*
- Winner of **Code-Together competitive programming** competition conducted by the hostel council of Hostel 2 *(Mar'23)*

## PROFESSIONAL EXPERIENCE

### Solar Analyst | SolarSquare Energy Pvt. Ltd. *(May'24 – Aug'24)*

- Conducted analysis on **residential solar** generation data using **Python, Pandas, MS Excel**, providing **data driven insights**.
- Developed **automated Excel** and Google Sheets **workflows** using **Openpyxl** to streamline data entry, **analysis**, and report generation, significantly **reducing manual work from 6hr to 40min**, and enhancing the overall **productivity** and efficiency.
- Created **3D models** for solar panel installations in **SketchUp**, and utilized **PVSyst** to **simulate** solar PV system performance
- Developed an **Excel-based calculator** to **optimize wiring costs** for PV panel installations, enabling **efficient cost analysis**.

## PROJECTS AND TECHNICAL ACTIVITIES

### Optimization of Solar based EV Charging Station| *Prof Zakir Rather, IIT Bombay* *(Present)*

- Designed and optimized Solar-powered EV charging station with battery storage system for efficient energy management.
- Implemented **MPPT algorithm** and **energy flow algorithm** to maximize solar energy usage and minimize grid dependency.
- Conducted simulations in **MATLAB/SIMULINK** to analyse the **EV charging station performance** under various conditions.
- Utilized the **EV load** data from **ACN Caltech** for simulation purpose, representing the **charging demand** of incoming EVs, and tested the **charging station's performance** under various **weather conditions** to ensure robustness and reliability.

### Battery-Free Pressure Leak Detection for Underground Gas Pipelines *(Present)*

*Detecting **pressure leaks** in underground gas pipelines is **challenging** due to **impractical** battery replacement. This solution uses **gas flow to generate power**, enabling battery- independent, **real-time leak detection** via **renewable** energy system.*

- Developed a **wind turbine-powered prototype** that converts the **gas flow** into electrical power for **detection of pressure leaks** in underground pipelines, eliminating the need for batteries, for **monitoring pipeline integrity**.
- Configured **boost converter** to align with the required voltage, ensuring **continuous operation** of sensor system.
- Designed a system with **Arduino UNO, 4G LTE Module, and pressure sensors** for real-time data transmission

### Phase Shifted Full-Bridge DC-DC Converter| *Prof Ravi Prakash Reddy, IIT Bombay* *(Present)*

- Studied the **Phase Shifted Full Bridge Converter (PSFB) topology** and its key **operational principles**, including the study of soft **switching Zero Voltage Switching (ZVS)** technique to **enhance the converter efficiency**, performance, and reliability.
- Conducted detailed **simulations on PLECS** to evaluate voltage and current behaviour across PSFB circuit elements.
- Performed **design calculations** for the key components in the PSFB, ensuring **optimal performance** and reliability.

### Pool heating using FPCs | *Prof Anish Modi, IIT Bombay* *(Feb'24 - Apr'24)*

- Project based on utilizing **solar thermal flat plate collectors** for **heating swimming pool water**, based on the load profile.
- Surveying literature, modelled solar data, **designing**, identifying suppliers, and assessed annual energy for savings.

### Wind Machine Prototype | *Prof Shireesh B. Kedare, IIT Bombay* *(Mar'24 – Apr'24)*

- Engineered multifunctional **wind energy conversion device** for diverse **applications** such as **lighting, pumping, and more**.
- Efficiently **fabricate** device, use local materials, conduct trials, record video, and demonstrate successful performance.
- Draft and make a report on the design, fabrication, application and **performance** of the **wind energy** device and present it

### Combined Cycle Power Plant | *Prof Anish Modi, IIT Bombay* *(Nov'23)*

- **Developed** and evaluated the efficiency of **combined Brayton-Rankine cycle** power plant through computational analysis.
- Performed comprehensive system **configuration**, component **modelling**, and plantlevel simulation to assess **performance**, followed by **economic analysis** for the cost-effectiveness of the Combined Brayton and Rankine cycle power plant design.

### Hyetograph Analysis | *Prof Dayadeep Monder, IIT Bombay* *(Sep'22)*

- **Analysed** the rainfall **patterns** across **India** using **statistical** tools like **Pandas and NumPy** in a team of two and **presented** insightful rainfall **visualizations** and **patterns** to senior management for a comprehensive data driven analysis of findings

- **Improved accuracy** and efficiency of rainfall data analysis process by providing **valuable insights** and to the fellow teams

**Parabolic Solar Cooker** | ***Prof Shireesh B. Kedare, IIT Bombay*** *(Apr'22)*

*Part of a **3- member team** which designed a **parabolic solar cooker** which reached a temperature of **85°C** in **15 minutes** and reached a maximum temperature of **171°C** within **48 minutes** in **Indore** with an atmosphere of temperature of **36°C***

- Discussed on the **design-parameters** and **cost-parameters** of the cooker, developed the complete working model in **2 days**
- Made few **test experiments** on different food items, made observations, and **few modifications** to **increase the efficiency**
- Calculated the **coefficient of performance**, **Figure of Merit** and also **improved** it by insulation and by using **Vinyl reflectors**

## POSITIONS OF RESPONSIBILITY

### Entrepreneurship Cell, IIT Bombay

***Asia's largest** Entrepreneurship-promoting body | **30000+** attendees | **900+** start-ups | Patronage from **UNESCO***

**1. National Entrepreneurship Challenge Mentor** *(Sep'22-Feb'23)*

- Mentored and led a bunch of **32+ teams and 450+members** from various colleges across India to establish their own E-Cell
- Conducted weekly bootcamps to **assist** the teams in upscaling their events and laying the **groundwork** for their E-Summit
- Contributed to developing of **20+ tasks** for the NEC, a national program to **establish** E-Cells in **700+ institutions across 90+** Indian cities, inspiring the youth to embrace entrepreneurship and startups, in collaboration with a **team of 24+ mentors**

**2. Events and PR Coordinator** *(Sep'22-Feb'23)*

- Co-organized E-Summit 2023: **30k+ attendees**, **700+ startups**, **120+ events**, **150+ speakers**, creating **engaging** discussions on turning the **challenges into opportunities**, and motivating and inspiring diverse participants from all across the country
- Demonstrating my **exceptional networking and collaborating skills**, I brought in over **20+ startup mentors and business coaches,** who can provide an invaluable guidance and support to the semi-finalists of **TTMM** through emails and LinkedIn

**3. NEC FINALS LEAD** *(Feb'23)*

- Demonstrated my **strong leadership skills** as one of the three leads of NEC Finals **accountable** for the successful planning, managing, and execution of the **National Entrepreneurship Challenge** Finals during the Entrepreneurship - Summit 2023
- Proven ability to establish and maintain a **strong connection** with a **network** of over **700+ colleges and 70+ schools** form **India and the Middle East**, ensuring a **widespread participation** and engagement during the NEC Finals in E-Summit-2023

### NSS IIT Bombay

**1. Activity Associate | Educational Outreach** *(Jun'22 – Jun'23)*

***11 out of 50+** applicants were selected through rigorous groundworks and **detailed interviews***

- **Leading a team of 20+ volunteers**, coordinating **1200+ hours** of community service under Ummeed Initiative, which **caters educational support** to the children of non-academic staffs, impacting the life of **more than 30+ students** in a positive way
- **Handed over** with the responsibility **grading of the volunteers** for volunteering in the **NSS courses -** NOCS01 and NOCS02
- Editing videos using **Shortcut software** for the **Open Learning Initiative**, a You-Tube channel aiming to break the language barriers in learning and development with videos in **9+** regional languages having **12 million+** views and **125K+ subscribers**

**2. FLARE 2023** *(Nov'22 )*

- Part of the **Events and Logistics Team for Flare** 2022, the annual **flagship event** of NSS IIT Bombay, conducting a series of competitions, workshops, sessions, and the Social Events with the participants from **30000+** schools and colleges Pan-India
- Exhibited the **outstanding interviewing abilities** during the interview of **Dr. Manan Vora**, a distinguished orthopaedic and sports medicine expert, and social media **influencer** with over **295k+** Instagram **followers**, resulting in the event's triumph

**3. Abhinay 2023** *(Mar'23)*

- Instrumental in creating platform for **100+ students**, promoting their talents and **providing opportunities** for their Artistry
- Contacted **40+** NGOs for participation through LinkedIn and Apollo, demonstrating **communication and outreach abilities**

## TECHNICAL SKILLS

| | |
|---|---|
| **Programming** | • C++, **Python, MTALAB, SIMULINK, PVSyst,** Flutter, Git, Dart, Logo |
| **Courses** | • Completed **Machine Learning Specialization** under **Andrew NG** by **Stanford University** on Coursera<br>• Completed Data Structures and Algorithms with under SOC'23 WnCC, IIT BOMBAY<br>• **Grasped** the knowledge of **Image Processing** in a session conducted by the ERC Club, IIT Bombay |

## EXTRA CURRICULAR ACTIVITIES

| | |
|---|---|
| **Sports** | • Got **designated** for the **interschool relay race** competition from among **80+ participants** *(Jul'17)*<br>• Secured the **1st place** in interhouse **relay race** competition from among **25+** participants *(Feb'13)* |
| **Volunteering** | • Contributed **80+ hours** of the **community service** (conducting classes and activity sessions for the students who cannot afford) under the **initiative LCCWA** of Educational Outreach, NSS IIT Bombay<br>• **Mentored** and guided **10+ students** of class **12** in their preparation for **MH-CET exams** *(Jan'21)* |
| **Communication** | • **Conducted** a session on the **working of the Solar Cells** to **700+ students and staff** in 10th *(Jul'17)*<br>• **Hosted** the **annual event** of the school with a **team of 5+,** in the sight of **800+** audience *(Sep'16)*<br>• **Interviewed** a student who **cracked JEE Main '**21 exams from **LCCWA NGO** under the guidance of **NSS volunteer** and **wrote a blog** on it in a **team of 3,** which got published on NSS webpage*(Aug'22)* |