



**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 ACHIEVEMENTS

- 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)
- 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**.

### Winner | Renewathon 2025 | Fourth Partner Energy| Energy Club, IIT Bombay

(Apr'25)

Developed a **novel 2 step solution** for minimizing **soiling losses** in solar panels at **cement industries**. The challenge aimed at replacing inefficient manual and chemical-based cleaning with advanced, technology-driven alternatives.

- Did a brief literature survey on current methods used for preventing soiling in PV Plants. Proposed a novel solution which uses sprinkler system, hydrophobic coating liquid, and use of **Electro Dynamic Screening** for **dust removal**.
- Designed a working principle mechanism for **superhydrophobic** and **self-cleaning** coatings with dust suppression sprinkler for the cement industries, Gentoo by **Ultratech International** was the proposed market available product
- Proposed **Electrodynamics Screening** method to further prevent soiling with an efficiency of **95%** for dust removal.
- Made **BOM** of the proposed solution and did **economic** analysis to compute upfront cost and simple payback period.

## PROJECTS AND TECHNICAL ACTIVITIES

### Sun Tracking System for PTC | Energy Design Project, IIT Bombay

(Apr'25)

Designed a **Sun Tracking System** for the **Parabolic Trough Collector** for improving the efficiency of the PTCs

- Designed a **single axis** active tracking system for Absolicon T160 Solar Collector with the motor **control algorithm**
- Calculated the net torque on the PTC, and selected **stepper motor** MST513 for a precise control and speed of **0.1°/s**
- Calculated the **gear ratio** for tracking which was **1:3** along with **planetary gearbox** of gear ratio **1:20** at the motor
- Choose **#50 chain and sprocket** system with **pitch 0.625"** – 60T and 20T gear, and **modelled** it on **SolidWorks**

### Hardware Project – Boost PFC Converter | Prof Ravi Prakash Reddy, IIT Bombay

(Sep'24)

Designed a **Boost PFC** for achieving unity power factor for a **30W** load and tested it on a lab scale

- Designed a **3.67mH inductor** from scratch, used **E42/21/20 core** and used **SWG 18** wire for winding on the core
- Designed **Boost PFC for unity power factor** – calculated inductor and capacitor values for the system requirements
- Designed the circuit of Boost PFC on a PCB – capacitor of **47μF**, **IN-5408** diodes, **IC-555 timer** for the control loop, MOSFETs, and a **100R 30W** load. **Soldered** the above components on **PCB** to make boost PFC for unity power factor
- Tested** the above setup experimentally in lab using autotransformer and oscilloscope, and got power factor of **0.90**

### Hardware Project - Battery-Free Leak Detection in Underground Gas Pipelines

(Sep'24)

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

### Optimization of Solar based EV Charging Station| Prof Zakir Rather, IIT Bombay

(Sep'24)

- Designed and optimized a **solar-powered EV charging station** with **battery storage** for efficient energy management.
- Developed **MPPT and energy flow algorithms** to maximize solar energy usage and minimize grid dependency.
- Conducted simulations in **MATLAB/SIMULINK** to analyse **station performance** under various conditions.
- Demonstrated **scalable and sustainable EV charging** infrastructure, supporting eco-friendly urban mobility solutions.

## Wind Machine Prototype | Prof Shireesh B. Kedare, IIT Bombay

(Mar'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 **modeling**, and plantlevel simulation to assess **performance**, followed by **economic analysis** for the cost-effectiveness of the Combined Brayton and Rankine cycle power plant design.

## Pool heating using FPCs | Prof Anish Modi, IIT Bombay

(Mar'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.

## 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

#### 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 **strong leadership skills** as one of the three leads of NEC Finals **accountable** for the success of the event
- Proven ability to establish and maintain a **strong connection** with a **network** of over **700+ colleges** and **70+ schools** from **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)

Was one of the **11 out of 50+** applicants who were selected through rigorous groundworks and **detailed interviews**

- Lead a team of 20+ volunteers**, coordinating **1200+ hours** of community service, impacting the life of **nearly 30+ students**
- Handed over** with the responsibility **grading of the volunteers** for volunteering in the **NSS courses** - NOCS01 and NOCS02

#### 2. FLARE 2023

(Nov'22)

- Part of **Events and Logistics Team** for Flare 2022, conducted a series of social events with **30000+** participants Pan-India
- Exhibited **outstanding interviewing skills** by interviewing **Dr. Manan Vora**, an orthopaedic and social media **influencer**

#### 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

Softwares	<ul style="list-style-type: none"><li>MATLAB, SIMULINK, PLECS, PVSyst, SAM, SolidWorks, NG Spice, PC1D5, CCS, Python</li></ul>
Courses	<ul style="list-style-type: none"><li>Completed <b>Machine Learning Specialization</b> under <b>Andrew NG</b> by <b>Stanford University</b> on Coursera</li><li><b>Grasped</b> the knowledge of <b>Image Processing</b> in a session conducted by the ERC Club, IIT Bombay</li></ul>

## EXTRA CURRICULAR ACTIVITIES

Sports	<ul style="list-style-type: none"><li>Got <b>designated</b> for the <b>interschool relay race</b> competition from among <b>80+ participants</b> (Jul'17)</li><li>Secured the <b>1<sup>st</sup> place</b> in interhouse <b>relay race</b> competition from among <b>25+ participants</b> (Feb'13)</li></ul>
Volunteering	<ul style="list-style-type: none"><li>Contributed <b>80+ hours</b> of the <b>community service</b> (conducting classes and activity sessions for the students who cannot afford) under the <b>initiative LCCWA</b> of Educational Outreach, NSS IIT Bombay</li><li><b>Mentored</b> and guided <b>10+ students</b> of class <b>12</b> in their preparation for <b>MH-CET exams</b> (Jan'21)</li></ul>