Manan Mehta
Mechanical Engineering
Indian Institute of Technology Bombay

22B2129
B.Tech.
Gender: Male
DOB: 21/07/2004

Examination	University	Institute	Year	CPI / % Credits
Graduation	IIT Bombay	IIT Bombay	2026	8.59 **Core:** 168 | **Total:** 174
Intermediate	HSC	Alpha Junior College of Science and Commerce	2022	96.17%
Matriculation	CBSE	The Somaiya School	2020	96.40%

Pursuing a **Minor** degree in **Computer Science** & **Engineering** with **Honors** in **Mechanical Engineering**

SCHOLASTIC ACHIEVEMENTS

- Selected for a semester exchange to **Technical University of Denmark (DTU)** for the spring semester '24 - '25 *('25)*
- Secured **99.20 percentile** in the JEE Advanced Examination out of **0.16 million** candidates from across India *('22)*
- Earned **AP Scholar** by achieving perfect **(5/5)** in **3** Advanced Placement exams conducted by **Collegeboard** *('22)*

TECHNICAL EXPERIENCE

Autonomous Robots & Multi-robot Systems Lab | *Researcher* | Advisor: Prof. Arpita Sinha [*Jun'25-Ongoing*]

- Designing real-time algorithms for **autonomous mobile manipulators** to transport objects in cluttered environments
- Conducting simulations to demonstrate the scalability of **cooperative manipulation** for possible real-world scenarios
- Working on implementing **decentralised Reinforcement Learning** control in robots for more efficient path planning

Technical University of Denmark | *Researcher* | Advisor: Assoc. Prof. Roberto Galeazzi [*Mar'25-Jun'25*]

- Designed **YOLOv9 based object detection** pipelines in custom **Docker** containers for maritime vessel classification
- Applied **transfer learning** to adapt pre-trained models, optimising to balance Precision, Recall, and inference speed
- Resolved environment and **dataset integration** issues in PyTorch, COCO formats, ensuring smoother workflows
- Conducted error analysis to reveal **7% recall drop** on small vessels, driving targeted dataset augmentation strategies

IITB Racing | *Electrical Systems Trainee* | Advisor: Prof. Sandeep Anand [*Feb'23-Jan'24*]

*3-tier cross-functional team which designs and fabricates an **electric race-car**, competing in the Formula Student*

Controls and Comms. Trainee	• Formulated **torque control algorithms**, including **torque vectoring** and **traction control** • Contributed to the **testing and debugging** of **integrated electrical systems** and their PCBs • Utilised **Autodesk EAGLE** to design PCBs and create advanced iterations of existing boards • Contributed in developing the **Electronic Control Unit (ECU)** for a **two-wheel drive electric car**
Formula Bharat	*Part of **36 member contingent** that secured **Overall Winners** in Electric Category from **30+ teams*** • Coordinated the documentation to make the car ready for the **electrical scrutineering** event • Performed **electrical bench testing** of automotive ECUs and CAN modules in the competition • Assisted in the assembly and managing of **electrical system integration** pre-competition
BMS Design	• Designed a small-scale **BMS PCB system** using **Autodesk Eagle** to monitor cell voltages and temperature along with implementation of **passive balancing** and **over-discharge protection** • Implemented **SPI communication** between multiple **slave** and **master BMS boards**

KEY PROJECTS

Pose Estimation and Control of Turtlebot | *IIT Bombay* | *SC649 Course Project* [*Oct'24-Nov'24*]

- Implemented an **Extended Kalman Filter (EKF)** in a simulated environment to estimate the 2D pose of a robot
- Measured the robot's pose using **trilateration** from three landmarks placed in the Gazebo simulation environment
- Implemented closed loop feedback control in Python to enable **trajectory tracking** for various reference paths

CFD Solver | *DTU, Denmark* | *41317 Course Project* [Apr'25-May'25]

- Developed a 2D incompressible Navier-Stokes solver for lid-driven cavity flow using **Finite Volume Method**
- Implemented **Central Difference Scheme (CDS)** for discretization of convective and diffusive fluxes, and gradients
- Optimised pressure solver via **LU factorization** of the Laplacian matrix and efficient forward/backward substitution

UAV Design | *DTU, Denmark* | *46110 Course Project* [Apr'25-May'25]

- Designed a conceptual model for a UAV to operate optimally on Mars based on the Ingenuity Rover by NASA
- Optimised airfoil and wing structures to increase payload capacity by **173%** whilst increasing the flight time by **124%**
- Implemented **Blade element Momentum** and **Lifting line theories** to achieve horizontal flight times upto **12m/s**

Microdroplet Generator | *Microfactory Initiative 2.0* | Advisor: Prof. Debjani Paul [Apr'24-Jul'24]

- Manufactured **PDMS** masters device using **micro-milling** machine to create a millipede-style microdroplet generator
- Designed and optimised acrylic moulds with appropriate dimensions, culminating in a space-constrained **CAD** model
- Created and compared prototypes made using **FDM 3d printing** and **micro-milling** for fluid flow channel moulds
- Achieved **12000+ 1 microlitre** droplets from two immiscible fluids: water and engineering oil (HFE7500)

Pressure Field Prediction in Fluids | *IIT Bombay* | *ME228 Course Project* [Mar'24-Apr'24]

- Formulated a model to predict pressure fields, utilising 15,000+ velocity data points derived from RANS equations
- Achieved **95% accuracy** by validating pressure fields against true values with **Scatter** and **Contour Plots**
- Applied feature scaling and trained **Multi-Layer Perceptron** with **5** hidden layers and with **1800+** parameters

POSITION OF RESPONSIBILITY

ELIT Head Teaching Assistant | *Student Mentorship Program* [May'24-Nov'24]

Part of the ELIT mentorship program, selected to guide and enhance students' English communication skills
- Led a team of **5 TAs** to conduct the ELIT orientation for **100+ freshers**, and curate resources for **150+** students
- Curated and created English learning resources for soft skills, grammar and writing to coach over **50+ students**
- Conducted personalised sessions for **4 students** to improve their fluency in **english and communication skills**

Campus Executive Mentor | *E-Cell, IIT Bombay* [Jul'23-Nov'23]

Part of 18 mentors** from a pool of **100+ applicants** with the mission of guiding executives from **across the nation
- Spearheaded one-on-one mentorship program to over **300+** Campus Executives, from across **100+ colleges** in India
- Strategised publicity campaigns resulting in **40% increase** in registrations; impacting **8500+** students across India

TECHNICAL SKILLS

- **Programming** : C, C++, HTML, Python (SciPy, PyTorch, Pandas, TensorFlow, NumPy, Matplotlib), MATLAB
- **Software** : Autodesk Eagle, Lt-Spice, Arduino, LaTeX, Autodesk Fusion-360, GOM Correlate, ROS, Docker

RELEVANT COURSES UNDERTAKEN

CS	Computer Programming (C++) | Computer Networks | DSA | Operating Systems | Digital Image Processing | Computer Graphics | Foundations of Intelligent and Learning Agents
Mechanical	Engineering Dynamics | Structural Materials | Fluid Mechanics | Thermodynamics | Solid Mechanics | Heat Transfer | Manufacturing | Design of Mechatronic Systems | CFD

EXTRA-CURRICULAR ACTIVITIES

Volunteering	Krittika, the Astronomy club of IIT Bombay [May '23 - Apr '24] • Delivered a hands-on observation session & talk to **400+ underprivileged school students** as a joint initiative by the Institute Technical Council & the **GNAANU foundation** • Served as the **event host** for Astromania, the flagship event, hosting over **150+ participants** • Facilitated in the conduction of **the K-CAP**, the computational astronomy project cum bootcamp organised by Krittika, with **10+ mentors, 7 projects**, and over **40+ mentees**
Cultural	• Represented Hostel 2 in the Wall Painting General Championship by Rang, IIT Bombay ['23] • Completed a year of training in classical Indian violin through the **NSO Violin** program ['22]
Technical	• Created a remote-controlled, Wi-Fi-enabled bot in the XLR8 competition by ERC ['22]