Reeyansh Shah

IIT Bombay
22B0412
Electrical Engineering
Dual Degree (B.Tech. + M.Tech.)
Specialization: Communication and Signal Processing

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Gender: Male
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Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2027	9.11
Intermediate	CBSE	Poddar Brio International School	2022	94.80%
Matriculation	ICSE	P.G Garodia (ICSE)	2020	97.80%

Pursuing a Minor degree in **Robotics** and **Artificial Intelligence and Data Science**, CMInDS, IIT Bombay

SCHOLASTIC ACHIEVEMENTS

- Achieved Department Rank **9** out of **100+** students in the **Electrical Engineering** Dual Degree program *['23]*
- Secured a **Change of Branch** awarded to the top **9%** out of **1400+** students owing to academic prowess *['23]*
- Awarded an **AP (Advanced Performer)** grade **(top 1%)** in **2** courses for exceptional performance *['23]*
- Ranked in the **top 1** percentile out of **0.16 million+** applicants in JEE Advance Examination across India *['22]*
- Attained **99.74** percentile out of **1 million+** candidates in the nationwide JEE Mains Entrance Exam *['22]*
- Recipient of the prestigious **KVPY Scholarship** bestowed upon the **top 1%** by the Government of India. *['22]*
- Placed in the **top 1%** of candidates who appeared for **NSEJS** conducted by IAPT in conjunction with HBCSE *['18]*
- Secured **National Rank 2** & **International Rank 36** in **Singapore & Asian Science Maths** Olympiad *['17]*

PROFESSIONAL EXPERIENCE

Software Architect | Invenco AI *[May '24 - Jul '24]*

India's first AI-driven company specializing in automated warehouse inventory tracking, pioneering supply chain solutions

- Developed real-time **image transfer protocol** for seamless drone-to-server communication using **Flask** package
- Designed and deployed a **Flutter** mobile application for remote drone control and **automated image uploads**
- Assembled **drones** and conducted **4+** hours of rigorous testing regimen, ensuring seamless communication

Data Analyst | NoQs *[Dec '23 - Jan '24]*

Pan-Indian digital firm specializing in comprehensive commerce solutions | *Received **LoR** from the **Director***

- Implemented **SQL** for data retrieval and leveraged **PowerBI** to create comprehensive and interactive user interface
- Utilized advanced formulas and dynamic charts on data to generate business reports aiding in **15%** cost reduction
- Developed **dynamic dashboards**, integrating employee and attendance **case studies** for data-driven analytics

KEY PROJECTS

ZeltaLabs Hackathon | Quant Team, IIT Bombay *[Feb '25 - Mar '25]*

- Engineered stop-loss strategies and applied Monte Carlo simulations to generate diverse scenarios for backtesting.
- Developed an Ethereum-based strategy (Sharpe 7, Drawdown 18%) using VWAP, MACD, and RSI for optimal signalling
- Implemented papers on RL, HMM-based trading strategies while exploring volatility, momentum, and volume indicators

3D Data Collector for IPEC | Wadhwani Electronic Lab, IIT Bombay *[May '24 - Jul '24]*

Guide: Prof. Siddhart Tallur, Department of Electrical Engineering, Indian Institute of Technology Bombay

- Enhanced setup to **Tri-Axis** by integrating **screw gauge** for Z-axis, installed limit switches for positional accuracy
- Designed a **PCB** in **KiCad**, connecting **MSP430**, limit switches, motors; thus performing soldering and crimping
- Developed and coded Arduino controller for motors, ensuring precise communication using **Serial Library** interface
- Designed **PyQt GUI** with manual and default scan modes integrating **automated scanning** for enhanced functionality, performed **error calibration** for accurate data reception, storing data points for future ML analysis

Exoskeleton Glove | Course Project *[Feb '25 - Present]*

Guide: Prof. Siddhart Tallur, Department of Electrical Engineering, Indian Institute of Technology Bombay

- Led a 5-member team to develop a sensor-integrated exoskeleton glove with rotary encoders and a custom PCB
- Built a 24-sensor network with multiplexed ADCs and IoT protocols, enabling wireless streaming with < 10ms latency
- Devised an innovative joint mechanism, achieving $\pm 2°$ flexion/rotation accuracy, validating through iterative prototyping
- Developed real-time Blender-to-Unity hand rigging pipeline synchronizing 20+ data points for sub-millisecond rendering

IITB RISC Pipeline Processor Design | Course project *[Apr '24 - May '24]*

Guide: Prof. Virendra Singh, Department of Electrical Engineering, Indian Institute of Technology Bombay

- Developed a **6-stage pipeline** to enhance instruction processing, throughput and maximise cycle frequency
- Implemented advanced features, such as a 2-level **data forwarding** logic and a history bit-based **branch predictor,** to minimise data hazards and improve branch prediction accuracy, ensuring smooth operation without stalls
- **Integrated hazard** mitigation units to ensure smooth operation and optimise performance of the pipeline processor
- Utilised **VHDL** Modeling to implement the **datapath design** and **control unit**, and simulated on **Quartus**

ADDITIONAL PROJECTS

Reinforcement Learning for Stock Trading | Web and Coding Club, IIT Bombay *[Jun '24 - Jul '24]*
- Explored quantitative trading strategies, backtesting, execution systems and **Markov Decision Processes** for **RL**
- Implemented **Deep Q-Learning** using **TensorFlow** to train CliffWalking **Atari** environment over **1000** episodes
- Developed a custom stock trading environment leveraging OpenAI Gym and Stable Baselines3 incorporating RL startegies

JPEG Compression Engine | Course Project *[Oct '25 - Nov' 25]*
Guide: Prof. Ajit Rajwade, Department of Computer Science, Indian Institute of Technology Bombay
- Designed JPEG-like compression using 2D DCT, adaptive quantization, and Huffman coding, achieving <0.5 RMSE
- Analyzed RMSE-BPP trends, detecting 1.2% RMSE spikes in noise and optimizing Huffman-JSON encoding.
- Implemented edge-based compression using Marr–Hildreth operator, JBIG for edge storage, PAQ coding for adjacent regions

Emission testing and diagnosis using near-field probes| Course Project *[Sep '25 - Nov' 25]*
Guide: Prof. Siddhart Tallur, Department of Electrical Engineering, Indian Institute of Technology Bombay
- Executed Radiated Emission testing in an anechoic chamber per CISPR 11/32, using biconical and horn antennas
- Investigated Conducted Emission via LISN, diagnosing failures in non-CE-marked adapters and analyzing power supply
- Performed near-field probe analysis to pinpoint electromagnetic emission sources on PCB traces, Bluetooth and RF devices

Solar Lantern Project | Self project *['22]*
- Designed a prism-shaped box to **strategically place** Solar Panels for versatile light absorption in **3+** orientations
- Analysed **technical viability** by calculating LED power consumption and estimated battery life of **28.57 hours**
- Conducted cost analysis comparing lanterns to incandescent lamps, revealing a **payback period** of **6500+** hours

Route Tracing Payload Dispatch Vehicle | Course project *[Nov '22 - Feb '23]*
Guide: Prof. Dinesh Sharma, Department of Electrical Engineering, Indian Institute of Technology Bombay
- Designed a **Line-Following Bot** with advanced drop-off capability, optimizing components for **20%** cost reduction
- Optimized design to achieve a **30% weight reduction** while enhancing load-bearing to **0.3 kg payload** capacity
- Leveraged **Fusion 360** for intricate 3D modeling and **LaserCAD** for precise laser cutting,optimizing the design

POSITION OF RESPONSIBILITY

Institute Academic Coordinator | EnPoWER, Undergraduate Academic Council *[May '23 - Apr '24]*
*Selected among **4** out of **200+** applicants to promote research and address academic queries of **5000+** students*
- Launched **ResCon**, a UG research conference, witnessing over **100** submissions & sponsorship of **INR 0.5 million**
- Ideated and executed flagship event **Enthuse** for **1400+** freshmen to foster research interest among them
- Led **Summer Undergraduate Research Program**, overseeing **80+** projects, **200+** students and **48+** professors

Teaching Assistant | IIT Bombay
- Introduction to Classical and Quantum Mechanics - Engineering Physics - Prof. Alok Shukla *[Jan'25 - Present]*
- Computer Programming & Utilization - Computer Science - Prof. Shivaram Kalyanikrishnan *[Jan'24 - Apr'24]*

Department Academic Mentor | Department of Electrical Engineering, IIT Bombay *[Jun '23 - Mar '24]*
*Selected among **34** mentors out of **175+** applicants, to assist sophomore undergraduates of the department*
- Guiding **12** students, organising departmental information sessions and contributing to academic counselling
- Working towards revamping the D-AMP blog and adding the academic **resources** for the reference of **200+** students

Summer of Science Mentor | Maths and Physics Club *[May '23 - Jul'23]*
- Mentored students to gain insights on Control Systems and perform simulations of Inverted Pendulum on **MATLAB**

TECHNICAL SKILLS

Languages : C, C+, Python, VHDL, Arduino IDE, HTML, CSS, SQL, Latex
Python Libraries : NumPy, Pandas, Tensorflow, OpenCV, Pytorch, Scipy
Tools and Software : kiCAD, Quartus, NGspice, Keil, Fusion 360, PyQt, Flutter, MATLAB, Git, AutoCAD

KEY COURSES

Data Science	Foundations of Intelligent Learning Agents*, Advanced Machine Learning* , Advanced Image Processing*, Programming for Data Science
Electrical Engineering	Probability and Random Processes, Communication, Microprocessors, Control Systems, Electronic Devices and Circuits, Analog Circuits, Digital Systems, Power Engineering

**to be completed by Apr '25*

EXTRACURRICULARS

- Ranked in the the top 3 in the **QRT Competition** conducted by **Qube Technologies** conducted on kaggle
- Ranked in top **5** percentile in ASSET talent search, invited to **Renzulli Programme** at **University of Connecticut**
- Achieved the prestigious International **Gold** Medal in **SpellBee** competition conducted by SpellBeeInternational
- Secured top honors in the Interschool **KenKen** Competition, surpassing **300+** students across Mumbai
- Successfully completed **3** levels of the **Akhil Bhartiya Gandharva** Mahavidyalaya certification in **Keyboard**
- Attained a top **20** ranking in the Mumbai Zonal Division of the esteemed Indian School **Scrabble** Championship