Toshan Achintya Golla | **22B2234**
Electrical Engineering | **B.Tech.**
Indian Institute of Technology Bombay | **Gender: Male**
DOB: 02/03/2005

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2026	
Intermediate	CBSE	Sri Sankara Senior Secondary School	2022	97.40%
Matriculation	CBSE	Sri Sankara Senior Secondary School	2020	95.60%

Pursuing a **Minor** Degree in **Computer Science and Engineering**

Scholastic Achievements

- Achieved **Department Rank 14** out of a batch of **110**+ students, obtaining **15**+ **AAs** over 4 semesters *(2024)*
- Awarded a **Change of Branch** to the Electrical Engineering B.Tech Programme out of **1400**+ students *(2023)*
- Accomplished **AP Grade** (Advanced Performer) for extraordinary performance in **Physical Chemistry** *(2023)*
- Secured **All India Rank 879** in *JEE Advanced* examination, competing among **0.15 million** candidates *(2022)*
- Secured **All India Rank 900** in *JEE Mains* examination, competing among **0.8 million**+ candidates *(2022)*

Professional Experience

Data Analyst Intern | NoQs Digital *(Dec 2023 - Jan 2024)*

Industrial Learning Program | Student Alumni Relations Cell | IIT Bombay

- Created insightful **Analytical Dashboards** using **Google Sheets** and **Power BI** to extract valuable insights from sparse datasets & present complex information in an efficient manner, facilitating **Data-driven decision-making**
- Employed **Autocrat** to automate document generation and mailing, facilitating efficient and streamlined processes
- Received **Letter of Recommendation** and honored with **Best Team Player** Award for my dedicated team work

Research Internship

Quantum Computing: Constant Adder Circuit *(May 2024 - Present)*

Guide: Prof. Anupam Chattopadhyay, Project Mentor: Siyi Wang | Nanyang Technological University

- Comprehended single and multi-qubit systems, and key quantum gates like **Hadamard, Toffoli** and Fredkin Gates
- Studied **Qiskit** python library to simulate circuits like the **GHZ** state generation and **multi-control** NOT gates
- Simulated a basic **constant adder** circuit by cascading **N-bit increment** circuits using borrowable **ancilla** bits
- Analyzed key parameters like **Toffoli** Count, Depth, and Qubit Count, and currently working on optimizing them

Key Projects Undertaken

Pipelined RISC Processor Design *(May 2024)*

Guide: Prof. Virendra Singh | Course Project: EE309-Microprocessors | IIT Bombay

- Worked in a team of 4 to design a **16-bit, 6-stage** pipelined RISC CPU with **8** registers to execute **26** instructions
- Designed the **5 pipeline** registers, **condition code** register and instruction **decoder** to generate **control** signals
- Detected data dependency and branching **hazards**, and employed data **forwarding** and **stalling** to mitigate them
- Programmed the CPU in **VHDL** and debugged false functioning through extensive **testing** using various programs

Into the RLVerse *(Dec 2023 - Jan 2024)*

Winter in Data Science | Analytics Club | *IIT Bombay*

- Implemented **Convolutional** Neural Networks using **PyTorch** for classification of MNIST dataset into **10** classes
- Comprehended **Markov** Decision Processes by solving fully-defined MDPs to get **optimal policies** using python
- Studied core concepts of Reinforcement Learning like **Policy** Iteration and Estimation, and Exploration-Exploitation
- Trained a **Sarsa** algorithm based 3x3 **Tic-Tac-Toe** agent capable of achieving proficiency against human opponents

Feature Selection and Prioritization *(Nov 2023)*

Guide : Prof. Vinay Kulkarni | Course Project: DS203-Programming for Data Science | IIT Bombay

- Conducted **EDA** on a chemical processing plant dataset having **200**+ features, thereby extracting useful insights
- Eliminated **multicollinearity** using a **correlation matrix**, reducing the number of features from over **70** to **15**
- Developed ML **models** to predict required parameters and determined **feature priority** based on their coefficients

Python for Data Science *(July 2023)*

Learners' Space | Career Cell | IIT Bombay

- Learnt **Numpy, Pandas, Matplotlib and Seaborn** libraries for storage, processing and visualization of big data
- Performed a gender-wise analysis of state and district literacy rates in the Census of India to derive valuable insights
- Learnt **SLR** and **MLR** to predict **Stock prices** using High, Low, Volume parameters and **Scikit-Learn** module
- Studied and applied **Logistic Regression** on diabetes data set by **Gradient Descent** to predict diabetes positivity

Other Projects

Solving Rubiks Cube with RL *(May 2024 - Present)*
Summer of Code | Web and Coding Club | IIT Bombay

- Analyzed **Deep-Q Networks** using **tensorflow-keras** for understanding **Value** and **Policy**-based approximation
- Developed DQN agents using rl-keras to play **OpenAI Gym** environments such as **CartPole** and **Space Invaders**

Case Study: TinyOwl Startup *(June 2023)*
Guide: Prof. Ramesh M | Course Project: ENT101-Introduction to Innovation and Entrepreneurship | IIT Bombay

- Contributed to a five-member team's review of the startup's **Customer Value Proposition** and Customer Profiles
- Acquired insights into potential startup **failure factors** by analyzing the reasons behind the downfall of TinyOwl
- Acted as founders of TinyOwl and produced an advertisement to **pitch** our startup idea to the classroom audience

Multi-Cycle CPU Design *(Nov 2023 - Dec 2023)*
Guide: Prof. Virendra Singh | Course Project: EE224-Digital Systems | IIT Bombay

- Collaborated in a **team of 4** to design a **8**-register **16-bit** computing system capable of executing **14** instructions
- Designed a **datapath**, **ALU** and **Moore** FSM of **22** states using state **equivalence** to output the **control** signals
- Simulated the CPU in **VHDL** with **64KB** memory, and created a **testbench** to test and verify every instruction

Microprocessor Interfacing and Programming *(Jan 2024 - Apr 2024)*
Guide: Prof. Nikhil Karamchandani | Course Project: EE337-Microprocessors Lab | IIT Bombay

- Implemented **array sorting** techniques in **assembly** language for an **8051** microcontroller using **Keil µVision5**
- Developed musical keyboard by **interfacing keypad** and speaker with **Pt-51** microcontroller using **Embedded-C**
- Built a **neural network** module, taking inputs using **USB-UART** via **Realterm** and showing outputs on a **LCD**

Path Cleaning Line Follower Bot *(Jan 2023 - Feb 2023)*
Guides: Prof. Dinesh K Sharma, Prof. Joseph John | Course Project: MS101-Makerspace | IIT Bombay

- Fabricated an **Arduino** bot in a team of 6, achieving **autonomous** navigation using IR sensors for line tracking
- Designed a chassis for the bot using **Fusion 360**, 3D Printing and Laser Cutting, and developed the Arduino **code**
- Performed comprehensive testing and added a **Servo Motor** with brushes, achieving autonomous **path cleaning**

Positions of Responsibility

Interview Coordinator | *Placement Cell | IIT Bombay* *(Nov 2023 - Dec 2023)*

- Coordinated with a team of **more than 250** students for organizing **interviews** of **more than 2000** applicants
- Contributed to the administration of examinations for **more than 20 firms** and handled the inquiries of applicants

Kava Culinary Club Convener | *Institute Cultural Council | IIT Bombay* *(Oct 2023 - Feb 2024)*

- Conceptualized an **Online Baking Competition**, offering baking enthusiasts a platform to showcase their skills
- Contributed to the organization & execution of **Lukkha Night**, an event featuring free food, bonfires and jamming
- Collaborated in a team of four to coordinate the procurement of essential equipment for the club's kitchen

Technical Skills

Programming	Python, C++, MySQL, Embedded C, 8051 Assembly, VHDL
Software	Keil µVision5, Quartus, LTSpice, XCircuit, Realterm, Autodesk Fusion 360, Arduino IDE

Key Courses Undertaken

Electrical	Digital Systems, Microprocessors, Analog Circuits, Signal Processing, Control Systems, Power Engineering, Probability & Random Processes, Electronic Devices, Communication Systems*, Electromagnetic Waves*, Makerspace
Computer Science	Programming for Data Science, Data Structures and Algorithms, Computer Programming and Utilization
Others	Calculus, Linear Algebra, Differential Equations, Classical and Quantum Mechanics, Engineering Mechanics, Chemistry, Biology, Design Thinking for Innovation, Economics, Introduction to Innovation and Entrepreneurship

**To be completed by Nov'24*

Extracurricular Activities

- Awarded Merit Certificate for securing **All India Rank 3603** in *Kishore Vaigyanik Protsahan Yojana - SX* *(2022)*
- Achieved **Fourth** position in the **Institute Badminton** Freshmen Open among more than 60 players *(May 2023)*
- Achieved **Third** in the **Under-15 State** Level **Badminton** Tournament among more than 50 players *(Feb 2019)*
- Completed a year long course in **Badminton** under the National Sports Organization *(2022-23)*
- Attained **First** position in Inter Hostel **Scrabble** General Championship for Hostel 3 among 10+ hostels *(Sep 2023)*
- Achieved Tamil Nadu **State rank 8th** and **10th** in SOF-National Science **Olympiad** in Class XII and X *(2021-22)*