Amrutha Varshini Chelluboyina | **22B0253**
Mechanical Engineering | **B.Tech.**
Indian Institute of Technology Bombay | **Gender: Female**
DOB: 14/02/2005

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2026	8.37
Intermediate	CBSE	Amity Global School	2022	90.60%
Matriculation	CBSE	Amity Global School	2020	98.00%

SCHOLASTIC ACHIEVEMENTS

- Attained **99.85** percentile in **JEE Mains** amongst **1 million+** candidates who appeared for the examination[2022]
- Secured **97.73** percentile in **Joint Entrance Examination Advanced** among 1.5 lakh+ students nationwide [2022]
- Awarded by the **District Magistrate** for topping the **CBSE** Board Exams with an **accolade** and **INR 10K** [2020]
- Secured **State Rank 28** and **All India Rank 202** in **International Informatics Olympiad Level 2** [2016]
- Secured **State Rank 50** and **All India Rank 319** in **International Olympiad of Mathematics Level 2** [2014]

PROFESSIONAL EXPERIENCE

SDE Intern at Amazon May 2024-July 2024 [May'24-July'24]

- Successfully expanded the JITA platform, which facilitates the creation of widgets and tooltips for sellers' conceptual understanding, from a single marketplace to a global presence. Developed and implemented a comprehensive stack to support additional marketplaces.
- Additionally, made significant UI and backend enhancements to the internal portal, enabling clients to seamlessly utilize the platform across all new marketplaces worldwide.

RESEARCH EXPERIENCE

Image processing using Komlogorov-Arnold Networks | Team Zero Waste | IIT Bombay [July'24-Present]

*In reference to the academic paper published by **Cornell University** on **Convolutional KANs** in **June'24***

- Engineered a **28x28** architecture for **grayscale** image processing with **learnable** non-linear activations at each pixel
- Conducted comparative analyses between **KAN Convolutional Networks** and **standard Convolutional Networks**, initially observing comparable results in accuracy and performance metrics with simpler models
- Extending KAN architecture from **28x28** to **128x128** resolution to support **Grayscale** and **RGB** image processing*

KEY PROJECTS

SGAN-Based 3D Model Generator | Self Project [June'24-Present]

- Designed and trained a multi-stage **Generative Adversarial Network** for **3D** voxel data generation from **2D** pixel sketches and refinement using **TensorFlow**, achieving advanced data synthesis from noise and class labels
- Implemented an **encoder** to extract key features from 2D images and a **decoder** to generate 3D voxel grids
- Develop a **WebApp** with user-friendly **UI** for user interaction and detailed visualization of generated models *

CheAGPT | Chemical Engineering Association [May'24-July'24]

- Extracted data from UG rulebooks and policy using **Textract** in Python, creating a **JSONL** dataset for analysis
- Tokenized the extracted text using **GPT2Tokeniser**, decoded the tokens into **UTF-8** format, and created chunks from these tokens, which were then embedded into vectors using **FAISS** to enable vector similarity calculations
- Developed a question-answer system using **GPT2LMHead Model**, enhancing document retrieval accuracy

FormFusion | Seasons of Code| Self Project [May'24-Present]

- Developed **Form handlers** using **Python and uAgents** library for processing form queries and submissions
- Leveraged **uAgents Protocols** for efficient, non-blocking, event-driven message handling in form management
- Utilized **Pydantic models** for defining, validating, and managing form data, ensuring integrity and consistency
- Design and maintain secure and efficient data routing and submission processes and deploy it on **DeltaV** platform *

Smart Waste Segreggation | EcoGenius | Institute Technical Summer Project [June'24-July'24]

- Implemented **VGG16** convolutional neural network model and trained it on the **TrashNet** dataset for waste sorting
- Utilized **OpenCV** to capture images, enabling the system to accurately classify different types of waste in **real-time**
- Optimized and fine-tuned the model parameters rigorously to achieve **80 % accuracy** in waste categorization

Sentiment Analysis for Customer Reviews | Self Project [May'24]

- Scraped text data using Python libraries like **httpx** and parsed HTML using **Parsel** for extracting customer reviews
- Utilized **TextBlob** for classification into positive, neutral, and negative categories, and also as factual or opinionated
- Visualized sentiment analysis results using **Matplotlib and Seaborn** to provide clear insights on the reviews

CRE in Bombardier Beetle | Course Project | Guided by: Prof. Sonali Das [March'24-May'24]

*Groundbreaking **1960** publication in **Science Journal** by **James et al.** detailing bombardier beetles' defence mechanism*

- Conducted an in-depth study of **Bombardier beetle's** chemical warfare tactics, focusing on **reaction engineering principles** including examination of the beetle's internal compartments that facilitate its explosive response
- Developed and solved **complex mathematical models** using **MATLAB** to validate findings of **James et al.**
- Explored and **analyzed** various **model parameters**, providing **insights** and promising real-life applications

OTHER TECHNICAL PROJECTS

- **Unit Converter. Designed and implemented a web based unit convertor using HTML,CSS and Javascript.This project allows the users to seamlessly convert between different units of measurement, providing a user friendly interface and ensuring accurate convertions**
- **Passenger Counter This application allows the user to input and track passenger counts,providing a user friendly interface and ensuring accurate convertions**
- **Black Jack Game. This project offers users an engaging and realistic casino experience, allowing them to play and enjoy the classic and game of BlackJack**

TECHNICAL SKILLS

Computer Science Fundamentals : Data Structures and algorithms, Database Management System, Object-oriented programme, Computer architecture and organisation, Operating Systems

Languages : C,C++,HTML,CSS,Javascript

Libraries/Framework : Node.js, React, Express.js

Tools : Git and Github, Ubuntu, Figma, AWS , Postman

Interpersonal Skills : Effective Communication,Teamwork,Time Management

POSITIONS OF RESPONSIBILITY

Technical Project Lead | Team Zero Waste, IIT Bombay [April'24-Present]

*Selected from **40+** students after a thorough interview process to work towards a **sustainable future***

- Developing a **smart waste bin** using advanced sensors like ultrasonic, soil moisture, and inductive proximity sensors
- Engineered an **end-to-end** Image classification **pipeline** using **VGG16 transfer learning** with **Keras**
- Implemented advanced image preprocessing techniques with **OpenCV** and **scikit-learn**, including **grid search with SVM** for optimal **hyperparameter-tuning**, achieving more than **80% accuracy** on **test data**
- Advocated for and discussed **key policies** concerning **green technology** and innovation during panel discussions

Web and Coding Club Convener | Institute Technical Council, IIT Bombay [May'23 - May'24]

*Selected among **350+** students after rigorous interviews, to represent the interests of over **10k+** students in Coding*

- Mentored **300+** students for **Intro to App Development Course** as a **TSS - Learners' Space Initiative**
- Crafted the **official WnCC website** from start to finish, using **Figma** to ensure a user-friendly User Interface
- Contributed to the **back-end development** of the **Seasons of Code Portal** using **Django Rest Framework**
- Conducted a 4-hour long session on **Scientific Programming** and covered various topics ranging from libraries like **NumPy, Pandas, SciPy, Matplotlib** etc. to **solving ODEs** during **Post Graduate Tech Week** in the institute

KEY COURSES

Machine Learning and Computer Science:	Introduction to Machine Learning, Intermediate Machine Learning, Introduction to Deep Learning, Feature Engineering, Artificial Intelligence and Data Science, Introduction to C++ (+lab course)
Mathematics:	Calculus I, Calculus II, Linear Algebra, Differential Equations
MakerSpace:	Electrical and Electronic Circuits, Engineering Drawings, Manufacturing (+lab course)
Entrepreneurship:	Introduction to Entrepreneurship

EXTRACURRICULAR ACTIVITIES

- Hosted **Intro to Scientific Programming Session** conducted by WnCC for the Post-Graduate Students [2024]
- Participated in a team of 4 in **XLR8** conducted by Electronics and Robotics Club, IIT Bombay [2023]
- Core Member, Entrepreneurship Cell(E-Cell)-Led the coordination and execution of various events, workshops, pitching competitions, and seminars to promote entrepreneurship and innovation among students
- Hosted **WnCC Freshie Orientation** conducted by ITC for the new Under-Graduate Entrants of 2023 [2023]
- Participated in **EnB Buzz** conducted by E-Cell, IIT Bombay pitching our startup idea before a panel of judges[2022]
- Mentored Class 7 students at **Vidya NGO** in Mathematics, covering topics like Factorization and Indices [2022]
- Produced YT lectures for Class 8 students on Mathematics, released on the official **NSS IIT Bombay** channel[2022]
- Conducted and organized **Mood Indigo's Got Talent** where over **100+** artists showcased their talent [2022]