Busa Siva Naga Venkata Aditya | **22B1024**
Computer Science & Engineering | **B.Tech.**
Indian Institute of Technology Bombay | **Gender: Male**
DOB: 21/08/2005

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2026	
Intermediate	TSBIE	Sri Chaitanya	2022	98.10%
Matriculation	TSBSE	Sri Chaitanya	2020	10

Pursuing **Minor** in **Entrepreneurship** from Desai Sethi School of Entrepreneurship, IIT Bombay

Scholastic Achievements

- Secured **All India Rank 53** in *Joint Entrance Examination Advanced* amongst **160,000** candidates *(2022)*
- Obtained **100 Percentile** in *Joint Entrance Examination Main* amongst more than **million** candidates *(2022)*
- Secured **All India Rank 7** in *Joint Entrance Examination Main Arch.* amongst **80,000** candidates *(2022)*
- Secured **Rank 7** in *Andhra Pradesh Engineering Entrance* (*EAPCET*) amongst **280,000** candidates *(2022)*

Competitions & Olympiads

- Among **top 40** students invited to attend selection camp of IJSO, International Junior Science Olympiad *(2020)*
- Secured **All India Rank 46** and **Awarded** the *Kishore Vaigyanik Protsahan Yojana (KVPY)* fellowship *(2022)*
- Actively engaging in Competitive programming Competitions hosted on various algorithmic programming sites including *CodeChef* : Max. rating **2060** (**5 Star**), *CodeForces* : Max. Rating **1946** (**Candidate Master**) *(2024)*
- **Secured Rank 1 and Awarded 50K Cash Prize** in *Code-Uncode*, an ICPC-Style (Preliminary, On-site Regionals and Finals) Competitive Programming contest with more than 1000 participants across India *(2024)*
- **Secured Rank 1** in every contest attempted as part of AlgoNinjas (Algorithms Camp at IIT Bombay) *(Ongoing)*
- Selected for **On-site semi-finals** round in the annual **Turing Cup** held by VNRVJIET, Hyderabad *(2024)*

Professional Experience

Tech Consultant | Nutribinge | FitFire *(ShARE Startup Project)*

Worked in a team of 7 members to provide Tech, Business solutions for improving sales *(Spring '24)*

- Enhanced **User Experience** & **SEO**: Identified and implemented 15+ strategic improvements, boosting site **visibility** and increasing user **retention time**, leading to a more engaging and seamless user experience
- Real-time Competitor Pricing: Built a **Web Scraper** to track prices on 5 competitor sites, aiding dynamic pricing
- Analyzed e-commerce sales to identify supply regions and opportunities, providing actionable **data insights**

Key Projects

Algorithmic AutoTrader *(Course Project, Autumn '24)*

Instructor : Prof. Ashutosh Kumar Gupta *(Course Name : Data Structures and Algorithms)*

- Developed **autonomous algorithmic system** utilising a **buy-low** and **sell-high** strategy to maximise profit
- Implemented **arbitrage detection** in trades using **Bellman-Ford** algorithm's **negative cycle detection**
- Enhanced the algorithm using **threads and locks** to optimize collective order execution for **complex linear combinations** and extended the system to manage the order book accommodating multiple quantities

Deep Dive into Operating System *(Course Project, Spring '24)*

Instructor : Prof. Mythili Vutukuru *(Course Name : Operating Systems)*

- Explored the internal workings of **xv6**, a simplified Operating System by examining it's various components
- Implemented custom **reader-writer locks** using pthread mutexes and condition variables, optimizing for both readerpriority and writer-priority modes to ensure **data consistency** and enhance **multi-threading** performance
- Developed a basic **filesystem** in an OS environment, gaining practical experience in file management and storage

Deep Learning and NLP Applications *(Seasons of Code, Ongoing)*

Web and Coding Club

- Implemented a **next-word predictor** model using **LSTM networks with keras**, including preprocessing, tokenization, sequence padding, and embedding techniques and achieved **95.7%** accuracy
- Developed a **Question pair** similarity model with feature engineering, preprocessing and word2vec embeddings, achieving **76.32%** accuracy with **Random Forest classifier**, minimizing confusion matrix error
- Implemented **LLM Arena**, an interactive **Gradio** application for comparing and benchmarking over **five** open source LLM **APIs** including features like **real-time scoreboard** updates for dynamic performance evaluation

Web Crawler *(Course Project, Spring '23)*

Instructor : Prof. Kameshwari Chebrolu *(Course Name : Software Systems Lab)*

- Developed a web crawler using Python for website content indexing, **recursively parsing HTML** pages
- Introduced **Customization** to the output, to provide detailed information about links, files at each recursion level
- Enhanced user interaction by incorporating **command line arguments** to specify website link, recursion threshold, type of segregation, and output file, significantly simplifying overall **User Controls** of the web crawler

Other Projects

Problem Selection Script *(Self Project, Summer '24)*

- Created a customizable problem-set generator for competitive programming that employs **requests** module to retrieve **JSON** data from **CodeForces** (Source-Website) **API**s and filters problems according to specified criteria
- Implemented **user-friendly feature** settings, including unsolved problem tracking, tag-based filtering, customizable output sorting, and difficulty filtering based on the number of submissions, enhancing the overall user experience

Text Processing and Compression *(Course Project, Autumn '24)*

Instructor : Prof. Ashutosh Gupta *(Course Name : Data Structures and Algorithms)*

- Designed a **context-based** autocomplete system using **Prefix Trie** and **KMP** techniques on user text history
- Integrated and optimised the **Lempel-Ziv'77**(LZ77) encoding to efficiently zip text files using **backreferencing**
- **Unified LZ77** and **Huffman coding** to develop a compression solution resembling the **DEFLATE** algorithm

Applications of Machine Learning *(Course Labs, Spring '24)*

Instructor : Prof. Swaprava Nath *(Course Name : Artificial Intelligence and Machine Learning)*

- Constructed a model with **Convolution** (for processing image), **ReLU** (for Activation), MaxPool, Flatten, FC & **Softmax** (for classification) layers as foundation, trained it on **MNIST** dataset to recognize handwritten digits
- Implemented **forward pass**, **back propagation** for layers in **Convolution Neural Network** and **Recurrent** Neural Network from scratch using Pytorch, numpy with **dynamic programming** for optimum time complexity

Micro-Architecture Based Optimisation *(Course Project, Autumn '24)*

Instructor : Prof. Biswabandhan Panda *(Course Name : Digital Logic and Computer Architecture)*

- Developed **merge sort** and **binary search** in **MIPS ISA** to optimise **query processing** in an unsorted array
- Simulated cache **replacement policies** like LRU, LFU, FIFO and BIP using **ChampSim** on diverse trace files
- Designed and optimized a **stream prefetcher** to achieve performance gains by analysing memory access patterns, fine-tuning **prefetch distance** and **degree**, and exceeding the performance of the IP Stride Prefetcher

Game Theory and Mechanism Design *(Course Project, Spring '24)*

Instructor : Prof. Swaprava Nath *(Course Name : Artificial Intelligence and Machine Learning)*

- Utilized **backward induction** and **alpha-beta pruning** algorithms to solve games such as Tic-Tac-Toe
- Applied various **voting rules**, including Plurality, Borda's rule, STV, and Copeland, to assess their **manipulability**
- Found **stable matchings** between suitors-reviewers using **Gale-Shapley Algorithm** and analysed the rankings

Position of Responsibility

Senior Member | ShARE *(IIT Bombay Chapter, '23-24)*

*Global Leadership Program hosting a cohort of **2700+** students from over **130** top universities across **50** countries.*

- Selected among **300+ serious applicants** through a rigorous procedure (**Statement of Purpose, Group Discussion Round, Interview**) based on **analytical and communication skills**
- Underwent 40+ hours of corporate training by ex-MBB consultants on problem-solving and effective communication
- Identified startups striving for **profit and social responsibility** and analysed them through a Strategic Presentation

Project Mentor | Seasons of Code *(Web and Coding Club, Ongoing)*

Competitive Programming Course

- Mentored **15 students** by providing **problem-set, tutorials, templates**, and assisted in **doubt solving**
- Conducted a competition using new, creative problems on **Hackerrank** Platform, provided tutorials for improvement

Relevant Courses

Computer Science	Software Systems Lab, Data Structures and Algorithms, Data Analysis and Interpretation, Digital Logic Design and Computer Architecture, Discrete Structures, Operating systems, AI/ML, Design and Analysis of Algorithms, Automata Theory and Logic for CS, Computer Networks*, Paradigms in Programming*, Implementation of Programming Languages*, Database and Information Systems Lab*
Languages	C, C++, Python, Java, Bash, AWK, SQL, MATLAB, SED
Development	HTML, CSS, JavaScript, Git, LaTeX
Libraries	NumPy, TensorFlow, PyTorch, Matplotlib, Pandas, Scipy

* - To be completed by Spring '25

Extracurricular Activities

- Mentored 4 students in **Consumer Theory** & **Behavioral Economics**, as part of Summer of Science *(Ongoing)*
- Mentored 2 teams-of-4 in CodeWars, a python-based game conducted by *Web and Coding Club, IIT Bombay (2024)*
- Ideated Solution for a Real-life Problem (**Social Media Fatigue**), Crafted a **Business Model Canvas**, Worked through the financials of it through EnB Buzz Competition conducted by *Entrepreneurship & Business Club (2022)*
- Completed a year long **National Sports Organisation** programme of **Lawn Tennis** at IIT Bombay *(2022-23)*
- Successfully organized an unofficial event *Know Your Peers* to increase the interaction among batchmates *(2023)*