Gangula Bhuvan Reddy
Computer Science & Engineering
Indian Institute of Technology Bombay

200050040
B.Tech.
Gender: Male
DOB: 31/01/2003

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2024	
Intermediate	BIEAP	Sri Chaitanya Junior College	2020	98.20%
Matriculation	Secondary State Board AP	Dr KKR's Gowtham International School	2018	10

Pursuing **Honours** in **Computer Science & Engineering**

Scholastic Achievements

- Secured **All India Rank 2** in **IIT JEE Advanced** out of over **1.5 lakh** candidates *(2020)*
- Secured **All India Rank 26** in **JEE Mains(B.Tech)** out of **1.1 million** candidates *(2020)*
- Recipient of the prestigious **KVPY Fellowship** by **IISc Bangalore** with an **All India Rank** of **133** *(2018-19)*
- Obtained **Rank 3** in **AP-EAMCET** 2020 out of **1.5 lakh** candidates conducted by the **APSCHE** *(2020)*
- Obtained **Rank 14** in **TS-EAMCET** 2020 among **1.2 lakh** candidates conducted by the **TSCHE** *(2020)*
- Secured **All India Rank 121** in **JEE Mains(B.Arch)** out of **150,000** candidates *(2020)*

Olympiads

- Cleared the **Indian National Mathematical Olympiad (INMO)** conducted by **HBCSE** *(2019)*
- Qualified amongst the **National Top 38** students in the **Indian National Physics Olympiad (INPhO)** *(2020)*
- Qualified amongst the **National Top 46** students in the **Indian National Chemistry Olympiad (INChO)** *(2020)*
- Part of the **Grading Team** of the **Asian Physics Olympiad(APhO)** in which **28 countries** participated *(2022)*
- Amongst the **top 1%** students across the nation in **NSEP (National Standard Examination in Physics)** *(2020)*
- Amongst the **top 1%** students across the nation in **NSEC (National Standard Examination in Chemistry)**hfill*(2020)*
- Amongst the **top 1%** students across the nation in **NSEA (National Standard Examination in Astronomy)** and qualified for the **INAO (Indian National Astronomy Olympiad)** *(2020)*
- Cleared the Regional Mathematical Olympiad (**RMO**) conducted by **HBCSE** and got selected for **INMO** *(2018-19)*

Key Projects

Medical Image Computing | *Prof. Suyash Awate* Course Project |*Spring 2022*

- Performed **Bayesian Denoising** of the Phantom **MRI** image using **Markov Random Field (MRF) Huber** Prior
- Segmented a **Brain MRI** image using **Fuzzy C-Means (FCM)** Algorithm, accounting for the **Bias Field** in MRI
- Performed the same using **Expectation Maximisation(EM)** Algo, relying on **Gaussian Mixture Model** and **MRF**
- Performed **Statistical Shape Analysis** using **Similiarity Transforms** and **Principal Component Analysis (PCA)** on **Human Hand** Shapes to Observe the Mean Shape & Modes of variation

Brain Tumour Segmentation | *Prof. Suyash Awate* Course Project |*Spring 2022*

- Trained **Deep Learning Models** to identify a **Brain Tumour** in MRI image of brain using the **BraTs DataSet**
- Solved the Task using both **Fully Convoluted Neural Network (FCN-8 & FCN-16)** and the **UNet** Architecture
- Performed various experiments to determine the best model using Metrics like **IOU Score, and Cross Entropy loss**

Float Moodle | *Prof. Amitabha Sanyal* Course Project |*Autumn 2021*

- Developed a **Dynamic Learning Management System** to host online courses using the **Django** framework
- Implemented **Role-Based Access Control** using **HTML , CSS** for the frontend and **PostgreSQL** as the database.
- Built a **Dashboard** for Students and Teachers to visualise **performance analysis** and the **grading statistics**
- Implemented **Auto Evaluation**, **TODO Lists**, **Discussion forums** and a **Chat box** for **Private messaging**

P2P Application | *Prof. Kameswari Chebrolu* Course Project |*Spring 2022*

- Implemented a **Peer to Peer Network** for searching and **downloading files** upto a specified neighbour depth
- Used **Multi-Threading** and implemented the **Client-Server** model in C++ for downloading files from the neighbours
- Established **two-way TCP** connections for **downloading** files and used **MD5** hash for error detection

Sudoku & Digit Recogniton *Self Project | Summer 2022*

- Created a **Convolutional Neural Network** for **digit recognition** using only **Numpy** for part of **MNIST dataset**
- Increased the **Accuracy** and decreased **time** by using **Keras** model to create the **CNN** for total MNIST dataset
- **Resized** the image of a sudoku grid according to size of MNIST dataset size and divided it into smaller grids of a cell
- Modified the dataset for **digit '0'**, used the obtained CNN on the smaller grids & solved sudoku using **py-sudoku**

Other Projects

Rush Hour Game | *Prof. Ashutosh Gupta* Course Project | *Feb' 2022*

- Encoded the famous **Rush Hour** game into an **SAT problem** and used an **SAT solver** to solve it in a given limit
- Used Python and **Z3py solver** to implement **DPLL , backtracking**-based algorithm to find a valid solution
- Understood and used the **Conflict-driven Clause Learning (CDCL)** optimisations in satisfiability solving

Study Planner App | *Prof. Amitabha Sanyal* Course Project | *Autumn 2021*

- Built an **Android App** that plans daily study and keeps track of all the assignments, exam schedules
- Added **Navigation Menu** and **tabbed fragments** to display different plans and events with a **recycler view**.
- Designed a feature to add/remove study plans saved in the local **database** and displayed on the dashboard.

RISC 16-bit Processor | *Prof. Virendra Singh* Course Project | *Spring 2022*

- Designed a simple **multi-cycle 16-bit RISC processor** with 8 registers based on the **Little Computer Architecture**
- Synthesised and assembled the essential processor components in INTEL **Quartus Prime** using **VHDL**

GitHub Profiles | *Prof. Amitabha Sanyal* Course Project | *Autumn 2021*

- Developed a **Web Application** using the **Django** framework where users can **Signup**, **Login** securely using their GitHub username and share their **GitHub** account's statistics and deployed on the **Heroku** platform
- Used **GitHub API** and Python's **requests** module to **fetch** User's data from GitHub and **store** it in database

Principal Component Analysis | *Prof. Suyash Awate* Course Project | *Autumn 2021*

- Denoised and reconstructed the images using the modes of variation having **eigenvalues** above a threshold
- Used principal component analysis for **dimensionality reduction**, **hyperplane fitting** and **classification** of images
- Performed **Multivariate Gaussian** fitting to **MNIST** dataset of handwritten digits to infer our handwriting tendencies

Scotland Yard | *Prof. Amitabha Sanyal* Course Project |*Autumn 2021*

- Used the concept of **Concurrency in Java** to implement the popular board game of the same name
- Utilized **Client-Server** Model and **threads** to generate random and manual players to play with **synchronization**
- Used **semaphores** and **locks** as **synchronization** primitives to have a **mutual exclusion** on variable control

Mandelbrot Zoom | *Prof. Bhaskaran Raman* Course Project |*Autumn 2021*

- Used the **SFML** graphic library in **C++** to create an **interactive** animation of the Recursive **Mandelbrot Set**
- Utilized **Object Oriented Programming** concepts & efficient **Data structures** to make **Zoom** In and Out Fastly

Key Courses Undertaken

Data Structures and Algorithms	Software Systems Lab	Data Analysis and Interpretation
Design and Analysis of Algorithms	Discrete Structures	Medical Image Computing
Logic for Computer Science	Digital Logic Design	Artificial Intelligence and Machine Learning*
Computer Programming and Utilisation	Operating Systems*	Abstractions and Paradigms for Programming
Calculus & Linear Algebra	Computer Architecture	Implementation of Programming Languages**
Database and Information Systems**	Automata Theory*	Speech, Natural Language Processing and the Web*
Computer Networks	Psychology*	Economics

Coursera – Machine-Learning by Andrew Ng*

**courses to be completed by Nov 2022, **courses to be completed by April 2023*

Technical Skills

Programming	C/C++, Python, Java, Bash, VHDL, Assembly, Awk, Sed, Prolog, Make, CMake
Data Analysis	Matlab, Octave, Matplotlib, NumPy, Pandas, SciPy, TensorFlow, Keras, scikit-learn
Software Development	Django, HTML5, CSS, Bootstrap, PostgreSQL, Heroku, JavaScript, Flutter
Other Tools	OpenCV, Git, LaTeX, FLTK, SFML, Android Studio, Z3solver, Wireshark

Extracurricular Activities

- Successfully completed training which included **Fitness** and **Drill** sessions under **NCC** (**National Cadet Corps**) IIT Bombay for **1 year** *(2020-2021)*
- Participated in the **National Science (VIJYOSHI) Camp** at Indian Institute of Science (**IISc**), **Bangalore** *(2019)*
- Participated in **Call of Duty** tournament conducted by **CSEA, IIT Bombay** *(2022)*
- Partcipated in the Sakshi India **Spell Bee** 2014 conducted by India Spell Bee *(2014)*