Erata Maharshi
Computer Science & Engineering
Indian Institute of Technology Bombay

210050049
B.Tech.
Gender: Male
DOB: 23/06/2004

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2025	6.08
Intermediate	BIEAP	Sri Chaitany Jr. Kalasala	2021	97.50%
Matriculation	BSEAP	Dr. KKR Gowtham High School	2019	10

Scholastic Achievements

- Achieved AIR 2040 and CR 7 in JEE Advanced out of 150,000 candidates. *(2021)*
- Achieved 99.64 percentile in JEE Mains among 939,000 candidates. *(2021)*
- Secured State Rank 266 in TS-EAMCET conducted by JNTU Hyderabad, Government of Telangana. *(2021)*
- Secured State Rank 530 in AP-EAMCET conducted by JNTU Kakinada, Government of Andhra Pradesh. *(2021)*

Key Projects

Weapon Detection — *Course Project* *(September 2023 - October 2023)*

Instructor: Prof. Preethi Jyothi. CS337 Artificial Intelligence and Machine Learning

- Developed an ML model to detect weapons in static images and live video streams for enhanced security.
- Integrated RCNN, Fast RCNN, Faster RCNN, and YOLO algorithms to achieve accurate and rapid detection.
- Curated and generated customized datasets from Roboflow, GitHub, Kaggle, ensuring effective model training.
- Applied the trained model for real-time detection, ensuring reliable performance in security applications.

Multiplayer Game — *Course Project* *(November 2022)*

Instructor: Prof. Kavi Arya. CS 251 Software Systems Lab

- Developed a Multiplayer Pictionary game by Socket concepts and principles of Game Development.
- Utilized HTML, CSS, and JavaScript, along with JS packages including NodeJs, ExpressJs, ReactJs, and Nodemon.
- Implemented a Scoreboard to track multiple instances of gameplay and employed a sophisticated Graphical User Interface (GUI) to enhance user experience.
- Incorporated a Login feature, allowing each player to have a unique identity through an username.

Rail Planner — *Course Project* *(July 2022- November 2022)*

Instructor: Prof. Supratik Chakraborty. CS 293 Data Structures and Algorithms

- Developed a program for organized storage of rail journeys and related information. Utilized a Dictionary data structure to store comprehensive details, including train journeys, station information, and precise timings for arrivals and departures.
- Implemented a Planner class, allowing seamless access and modification of train-related information, with distinct user roles such as Administrator, User, and Reviewer.
- Established a review management system utilizing max-heap and min-heap objects for retrieving Best and Worst reviews. Provided users with the option to request additional reviews, enhancing the flexibility and customization of the system.

Distributions, Expectations — *Course Project* *(October 2022)*

Instructor: Prof. Suyash P. Awate. CS 215 Data Analysis and Interpretation

- Conducted analyses of various scenarios and visualized outcomes using MATLAB and Matplotlib. Plotted Probability Density Function (PDF) and Cumulative Distribution Function (CDF), and calculated the approximate variance for Laplace, Gumbel, and Cauchy Distributions.
- Simulated Random Walker steps and generated Histograms and Box-Plots for different numbers of steps. Additionally, created a Space-Time graph using the rand() function in MATLAB.
- Generated datasets with specified sizes and ranges using the Uniform distribution function as a random function. Repeated the process with Gaussian and Normal distributions, analyzed the differences in datasets, and plotted the Mean Error using Box-Plots for the two cases.

TAGE Predictor for SAT solvers — *Course Project* *(November 2022)*

Instructor: Prof. Biswabandan Panda. CS 230 Digital Logic Design and Computer Architecture

- Developed a branch predictor featuring a base bimodal predictor supported by tagged component predictors with varying history lengths.
- Implemented prediction logic prioritizing the longest matching history and alternate predictions for higher accuracy.
- Designed a loop predictor for detecting regular loops with consistent iterations, incorporating a replacement policy based on loop age and execution confidence.

Other Projects

Tele-Communication System Design — *Courese Project* *(January 2023)*

Instructor: Prof. Bhaskar Raman. CS 224 Computer Networks

- Developed a telecommunications model using musical swaras to encode and decode 3-bit information packets.
- Implemented a Python-based system for sound generation and error detection using Two-Dimensional Parity.
- Ensured reliable message transmission by incorporating framing, parity checks, and error correction mechanisms.

Vtune Profiling and Cache Replacement — *Course Project* *(November 2022)*

Instructor: Prof. Biswabandan Panda. CS 230 Digital Logic Design and Computer Architecture

- Used VTune for hotspot detection and optimization, reporting top hotspot functions and their CPU time percentages
- Analyzed performance metrics like the number of instructions retired, average CPU frequency, and logical core utilization, comparing these with core utilization from performance snapshots.
- Utilized CHAPsim to compare cache replacement policies (LFU, FIFO, Random) for IPC and LLC miss rates.

FLTK Game — *Course Project* *(Spring 2021)*

Instructor: Prof. Rushikesh K Joshi. CS 154 Abstractions and Paradigms for Programming

- Designed a single-user interactive Maze game using C++ and the FLTK Library.
- Incorporated features like a drop-down settings menu, reset, quit, game settings, and hardness levels.
- Provided users the flexibility to resize the game portal and intelligently manage the resizing of in-game objects.

Personal Website — *Course Project* *(August 2022)*

Instructor: Prof. Kavi Arya. CS 251 Software Systems Lab

- Created a personal portfolio website using HTML, JavaScript, CSS, and Bootstrap, featuring sections like Home, About, Contact, Hobbies, Projects, Achievements, and Schedules
- Implemented a user-friendly drop-down menu for seamless navigation between different sections within the website.
- Designed an interactive Hobbies page featuring a Checklist form. This page dynamically presents descriptions and expresses personal interest in specific sports or games selected by the user.

Dijkstra's Algorithm — *Course Project* *(October 2022)*

Instructor: Prof. Kavi Arya. CS 251 Software Systems Lab

- Implemented Dijkstra's, Greedy Algorithm to calculate minimum distance between two nodes in DAG.
- Utilizing the algorithms to update and return the minimum distances of every node from the source in a listed format, including the node names and their corresponding minimum distances.

Technical Skills

Languages	C, C++, Python, VHDL, Verilog, Assembly(x86), MATLAB.
Software Skills	Git, GitHub, LaTeX, Web scraping, Networking, SQL.
Web development	HTML, CSS, Javascript, Bootstrap, NodeJS, APIs, Sockets.
Python Packages	NumPy, Pandas, Scikit-learn, Tensorflow, Matplotlib, Torchvision, SQLite

Courses Undertaken

Computer Science	Data Structures and Algorithms, Artificial Intelligence and Machine Learning, Database and Information Systems, Computer Networks, Operating Systems, Software Systems Lab, Data Analysis and Interpretation, Digital Logic Design and Computer Architecture, Implementation of Programming Languages, Discrete Structures, Automata Theory, Design and Analysis of Algorithms, Abstractions and Paradigms for programming, Computer Programming and Utilization, Game Theory and Algorithmic Mechanism Design, Information Retrieval and Mining for Hypertext and the Web*, Optimisation for Large Scale Machine Learning*
Miscellaneous	Calculus, Linear Algebra, Differential Equations, Numerical Analysis, Decision Analysis and Game Theory, Economics, Psychology, Probability and Stochastic Processes I*, Introduction to Electrical and Electronics Circuits, Engineering Graphics and Drawing, Quantum Physics and Application, Organic, Inorganic, Physical Chemistry, Basics of Electricity and Magnetism, Biology, Molecular Cell Biology, Environmental Studies*, Nonconventional Energy Sources*

**ongoing courses to be completed by December 2024*

Extracurricular Activities

- Completed a year long NSO programme at IIT Bombay *(2022)*
- Elected as Class Representative in Seventh Standard of my Schooling. *(2015)*
- Participated in District level Art competition, Telugu Book of Records. *(2016)*
- Selected my cross-contoured Drawing as First Prize for Drawing Contest conducted by our school participated by all standard students. *(2016)*