Poluparthi Preetham | **190050085**
Computer Science & Engineering | **B.Tech.**
Indian Institute of Technology, Bombay | **Gender: Male**
DOB: 02-02-2002

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2023	
Intermediate	Board of Intermediate Education, AP	Sri Venkateswara Junior College, Visakhapatnam	2019	9.9
Matriculation	Andhra Pradesh Secondary School Certificate	Narayana High School,Vizianagram	2017	10

Pursuing **Honors** in Computer Science and Engineering and **Minor** in Data Science

Scholastic Achievements

- Secured **All India Rank 379** in **JEE Advanced** among 1.6 million aspirants *(2019)*
- Achieved **99.9 percentile** in **JEE Main** among 1.1 million aspirants *(2019)*
- Achieved **International Rank 53** in the finals of International Mathematics Olympiad by SOF *(2016)*
- Secured **Rank 57** in **Andhra Pradesh EAMCET** among 1.7 lakh candidates *(2019)*
- Scored **382/450** in **BITSAT** (Birla Institute of Technology and Science Aptitude Test) *(2019)*

Internships

Automated Doubt Solving *Summer 2021*
Vedantu Innovations Pvt. Ltd. | *Data Science Intern* *Bengaluru, Karnataka, India*

- Performed **topic modelling** using **elbow method** on Latent Dirichlet Allocation and Hierarchical Dirichlet Process
- Explored subtopic clustering by **Latent Semantic Analysis** on similarity matrix of doc2vec embedding vectors
- Analysed various resources on **question answering** using bidirectional attention flow (**BiDAF**) model
- Used python packages like **gensim**, **tensorflow**, **scikit-learn** and successfully classified text messages

Key Projects

Color Image Denoising *Spring 2021*
Guide:Ajit Rajwade | *Course Project* *IIT Bombay*

- Performed multi channel signal restoration using **dictionary learning** without producing any false colors and artifacts
- Implemented **K-SVD algorithm** to train **overcomplete dictionary** and removed additive white gaussian noise
- Used Orthonormal Matching Pursuit (**OMP**) algorithm to retrieve sparse approximation of noised image patches

Code Frisk *Autumn 2020*
Guide: Prof. Amitabha Sanyal | *Course Project* *IIT Bombay*

- Built a software to determine the **mutual similarity** among multiple programs written in C++, Java, Python
- Implemented features like **whitespace insensitivity**, position independence and **noise suppression**
- Developed a secure authenticating system using **Django**, implemented token authentication using **REST API**
- Removed **redundant functions** and comments, and **replaced macros** in the source code using g++ preprocessing

Apptegration *Summer 2020*
Institute Technical Summer Project *IIT Bombay*

- Worked as a team of four to develop an **Android app** that solves numerical integrations from camera images
- Generated large number of mathematical equations from an individual data set containing mathematical symbols
- Produced corresponding Latex sequences to train a **seq2seq model** with a **CNN-LSTM** architecture

SAT Solver *Spring 2021*
Guide: Prof. Ashutosh Gupta | *Course Project* *IIT Bombay*

- Simulated player two's moves for the mastermind game using **SAT encoding** that is tolerant to unreliable player one
- Developed a harnesser for removing the minimal set of edges from a Graph such that given two nodes are disconnected
- Encoded **Sudoku puzzle** and the **N queens problem** as boolean expressions and used **z3** python module to solve

Other Projects

Compressive Sensing *Spring 2021*
Guide: Prof. Ajit Rajwade | Course Project *IIT Bombay*
- Recovered a video from single exposure **coded snapshot** superimposed over multiple frames using compressive sensing
- Implemented Iterative Shrinkge Threshold Algorithm (**ISTA**) over Haar wavelet and **DCT basis** for image denoising

Strongly Connected Graphs *Autumn 2020*
Guide: Prof. Ajit Diwan | Course Project *IIT Bombay*
- Developed a C++ program that finds out all the **strong bridges** in a graph by computing **edge dominators**
- Implemented a sparse table to compute least common ancestor of two nodes in the **dominator tree** of a graph
- Solved the strong connectivity augmentation problem using **Eswaran and Tarjan's algorithm**

Network Simulator *Spring 2021*
Guide: Prof. Vinay Ribeiro | Course Project *IIT Bombay*
- Generated numerous environments using **ns3** to simulate information transfer between various pairs of nodes
- Simulated **FTP** and **CBR** flows using socket programming and observed the effects of delay and speed on throughput

Data Structures and Algorithms *Autumn 2020*
Guide: Prof. Ajit Diwan | Course Project *IIT Bombay*
- Developed a **quadtree** class, a tree data structure to represent binary images with efficient usage of memory
- Developed a C++ library containing **permutation class** that supports logarithms, square root for permutations in linear time using **extended euclidean algorithm** in conjunction with extended **chinese remainder theorem**
- Studied extremal properties of infinite words generated by **Fibonacci morphism** and **Thue-Morse morphism**

Image Reconstruction through PCA *Autumn 2020*
Guide: Prof. Suyash Awate | Course Project *IIT Bombay*
- Identified significant modes of variation in the MNIST dataset using **Principle Component Analysis**
- Denoised and reconstructed the images using the modes of variation having **Eigen values** above a threshold

Technical Skills

Programming	C++, C, Python, Bash, Java, SQL, VHDL
Web Development	HTML5, CSS, Angular, Bootstrap, JavaScript, PHP, Django
Data Science	MATLAB/GNU Octave, nltk, Gensim, Pandas, TensorFlow, Scikit-learn
Software	Android Studio, Git, LaTeX, SOLIDWORKS, AutoCAD

Positions of Responsibility

Teaching Assistant *Dec 2020 - Mar 2021*
CS 101, Computer Programming and Utilization
- Conducted regular doubt sessions for a batch of 12 students under the guidance of Prof. Bhaskaran Raman
- Covered and explained the concepts of C++, solved their doubts and helped them to prepare for examinations

Courses Undertaken

Computer Science	Data Structures & Algorithms + Lab, Discrete Structures, Software Systems Lab, Design and Analysis of Algorithms, Logic for Computer Science, Computer Networks + Lab, Computer Architecture*, Operating Systems + Lab*, Introduction of Blockchains, Cryptocurrencies and Smart Contracts*
Data Science	Data Analysis & Interpretation, Advanced Image Processing, Foundations of Intelligent and Learning Agents*, Artificial Intelligence and Machine Learning + Lab*, Learning with Graphs
Mathematics	Probability Theory, Calculus, Linear Algebra, Differential Equations

**To be completed by November 2021*

Extracurriculars

- Worked as a volunteer in Covid-19 vaccine **awareness campaign** at a primary healthcare centre *(2021)*
- Successfully completed a year long course under **NSO** in **Squash** in the freshman year *(2019)*
- Secured **Global rank 99** in July Lunchtime **programming contest** in codechef *(2020)*
- Active on **codechef** with **rating 1869**, **codeforces** with **maximum rating 1646** *(2020)*
- **Mentored** a **JEE aspirant** aiming for JEE 2022 by solving his queries in Physics *(2020)*

Scholastic achievements and extracurricular activities are not verified by the Placement Cell