Mantri Krishna Sri Ipsit | **180070032**
Electrical Engineering | **B.Tech.**
Indian Institute of Technology Bombay | **Gender: Male**
DOB: 22-06-2000

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2022	9.38
Intermediate	TSBIE	Sri Chaitanya Narayana Junior College	2018	98.40%
Matriculation	BSEAP	Sri Chaitanya High School	2016	10

Pursuing **Double Minor** Degrees in **Computer Science and Engineering** and in **AI & Data Science**

SCHOLASTIC ACHIEVEMENTS

- Received a **certificate of merit** for extraordinary performance in **Digital Signal Processing** course (2020)
- Secured an All India Rank of **242** in JEE Advanced among over 0.2 million candidates (2018)
- Secured an All India Rank of **123** in JEE Mains (Engineering) among over 1.3 million candidates (2018)
- Placed in **national top 1%** in NSEC and NSEA and selected to appear for INChO and INAO (2018)
- Recipient of the **KVPY Fellowship** by Department of Science and Technology, **Government of India** (2016)

INTERNSHIPS

Automation of Query Expansion Pipeline **Microsoft**
Software Engineer Intern, Defensive Search @ Bing *May'21-Jul'21*
- Developed a framework to automate the query expansion process to improve **agility** and **quality** using crowdsource
- Reduced query treatment time from **1 day to 3 hours** by using query sampling techniques to minimize the budget
- Built a **job manager** for submitting and tracking multiple workflows enabling **concurrency** without conflicts

Handbook on Algorithms and Digital Logic **Unacademy**
Content Developer, India's largest learning plaform *Dec'20-Jan'21*
- Curated a set of practice problems on various **Data Structures** for **GATE aspirants** of Computer Science stream
- Prepared **error-free** and detailed solutions for the problems after throughly **reviewing** the concepts involved

MicroMARS: Mars Rover Navigator **Microsoft**
The Mars Colonization Program, Engage 2020 *Jun'20-Jul'20*
- Developed a web app in **Angular** to simulate the movement of a mars rover by ideating on different scenarios
- Implemented various **shortest-path** and **maze-generator** algorithms like Dijkstra,Floyd-Warshall,Prim&Sidewinder
- Modelled the **terrain** of Mars on a 2D grid using different types of obstacles and tackled **travelling salesman problem**

RESEARCH EXPERIENCE

Combinatorial Algorithms on Graphs | Bachelors' Thesis **IIT Bombay**
Prof. Abir De, Department of Computer Science and Engineering *July'21-Present*
- **Goal.** Coming up with neural gadgets to solve NP-hard combinatorial graph algorithms in a supervised fashion
- **Impact.** Speed up in inference on billion sized graphs with applications in areas like shortest path, node similarity etc.

Climate risk exposure of firms in S&P 500 using NLP **Indian School of Business Hyderabad**
Prof. Nitin Kumar, Center for Analytical Finance *Apr'20 - Jun'20*
- Reviewed literature on traditional **linguistic** analysis in finance and current S.O.T.A deep learning methods
- Extracted text from websites and various articles using **Python** and modelled the topics using **LDA** and **TSNE**
- Built a deep **LSTM** model to tag climate-related words in 10-Ks to come up with a measure of risk using **PyTorch**

Automated Gleason Grading using Deep Neural Networks **IIT Bombay**
Prof. Amit Sethi, Medical Deep Learning & AI Lab (MeDAL) *Jan'20 - Jun'20*
- Gleason grading is a prognostic technique for **prostate cancer**;based on specific patterns present in prostate biopsies
- Approached this problem separately as image **classification** and **segmentation** on whole slide images using **PyTorch**
- Experimented with attention-based multiple instance learning (**A-MIL**) and achieved a patch level accuracy of **52.4%**
- Achieved 0.1 higher **Cohen's Kappa** Score of **0.53** between model and ground truth using the segmentation approach

Multi-Organ Nuclei Segmentation **IIT Bombay**
Prof. Amit Sethi, Medical Deep Learning & AI Lab (MeDAL) *Dec'19-Jan'20*
- Employed a **sliding window** CNN and a UNet on over **22,000** hand annotated nuclei on H&E stained images
- Trained the models on data spanning 4 different organs and tested them on **3 unseen organs** for 3 classes in **Pytorch**
- Implemented Structure-Preserving Color Normalization (**SPCN**) on WSIs using **SNMF** and SPAMS package
- Adopted **iterative region growing** to get n-ary Nuclear Maps and used **Aggregated Jaccard-Index** as accuracy metric

ACADEMIC PROJECTS

Face Recognition using Tensorflow **Course Project**
Prof. Abir De, Introduction to Machine Learning *Apr'21-May'21*
- Implemented the **FaceNet** model using **Keras subclassing API** and trained it using **triplet loss** on LFW dataset
- **Visualized** the embeddings using PCA, t-SNE and interdistance matrix and tested the model on personal photographs

Statistical Compressed Sensing of Gaussian Mixture Models **Course Project**
Prof. Ajit Rajwade, Advanced Image Processing *Apr'21-May'21*
- Exploited **statistical properties** of natural images to reconstruct them using a **linear** decoder in **MATLAB**
- Compared results of SCS with conventional CS using a dictionary learnt via **K-SVD** on Berkeley Segmentation dataset
- Performed **blind CS** on standard images like **Lena** and Peppers and contrasted the results with SCS and CCS

Quantum Machine Learning for HEP at LHC **Machine Learning for Science Umbrella Organization**
Self Project *Mar'21-Apr'21*
- Implemented Quantum CNN and Quantum GAN using **Tensorflow Quantum** for high energy particle classification
- Implemented both **Node** and **Graph** Classification networks using **Deep Graph Library** for particle jet classification

Fast Texture Transfer using Wavelets **Course Project**
Prof. Ajit Rajwade, Fundamentals of Digital Image Processing *Nov'20-Dec'20*
- Used **wavelet-based image fusion** to transfer texture from texture image to source image taking **linear time** wrt size
- Employed **CDF** 9/7 wavelet decomposition on Y channel and used **histogram matching** for better visual appeal

Constellation Detection **IIT Bombay**
Institute Technical Summer Project, Institute Technical Council *Jun'19-Jul'19*
- Devised a mechanism to detect constellations irrespective of rotation or scaling using **Geometric Hashing**
- Used **similarity metrics** like cosine and gaussian similarities to compare hashcodes and designed a GUI using **Tkinter**

Sketching Images using Python **IIT Bombay**
Hobby Project, Python Art *Jun'19-Jul'19*
- Developed an algorithm in **python** to sketch any given image using the concept of **edge detection**
- Used OpenCV library to detect the edges in an image and **Turtle** library to draw them on a blank canvas

TECHNICAL SKILLS

Languages: C++, Python, MATLAB, C#
Web Dev: HTML, CSS, JS, TS, Angular
ML: PyTorch, Tensorflow, Scikit-Learn
Software: Git, Visual Studio, LaTeX, GNURadio
Boards: Arduino, Raspberry Pi, 8051μC
Others: Cirq, TFQ, DGL, PyTorch Geometric

KEY COURSES UNDERTAKEN

EE: Advanced Data Networks[†], Digital Signal Processing, Probability & Random Processes, Wavelets
CS: Logic in CS, DSA, Computer Networks, Operating Systems[‡],Intelligent and Learning Agents[†]
AI: Programming for Data Science[†], Introduction to ML, Deep Learning for Computer Vision, Basic and Advanced Image Processing, Data Analysis and Interpretation, Linear Algebra

[†], [‡]to be completed by December 2021, May 2022 respectively

POSITIONS OF RESPONSIBILITY

Web Nominee, Hostel Affairs Council **IIT Bombay**
Tier-2 Position, Council formulates policies with Institute functionaries *Jul'20-May'21*
- Created and **deployed** portals used by institute functionaries and students for **vital operations**
- Revamped Married Research Scholar Portal for **Hostel Coordinating Unit** to manage operations in **3** buildings
- Developed a website for **DoSA Office** with information about various student activities and respective POCs

Undergraduate Teaching Assistant **IIT Bombay**
MA 108 - Ordinary Differential Equations, Prof. Prachi Mahajan *May'21-Jun'21*
- Conducted weekly **tutorial** sessions for a batch of 50 freshmen and helped them with through **personal interaction**
- Provided assistance to the course instructor in **course logistics** by proctoring exams

Class Representative **IIT Bombay**
3rd-year B.Tech., Department of Electrical Engineering *Aug'20-May'21*
- Responsible for **bridging the gap** between a batch of **75** students and professors about academics and logistics
- Aided the instructors and the students to adapt to the new normal of **online education** by being their **first POC**

EXTRA-CURRICULAR ACTIVITIES

- Participated in the **Web Development** Bootcamp at Technical Summer School, IIT Bombay (2019)
- Completed an year-long training in **Lawn Tennis** under **National Sports Organization** (2018)
- Volunteered in **IIT Bombay Half Marathon** organized by IIT Bombay Sports (2018)
- Attended the **Vijyoshi Science Camp** organized by the **Indian Institute of Science** (IISc) (2017)