

Pursuing a **Minor** degree in **Artificial Intelligence** and **Data Science** from **C-MInDS, IIT Bombay**

## SCHOLASTIC ACHIEVEMENTS

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- Achieved **99.81 Percentile** in **JEE-Main** out of over 1 million candidates (2021)
- Secured **All India Rank 1207** in **JEE-Advanced** out of over 0.14 million candidates (2021)
- Secured **AP grade** for excellent performance in **PH 108-Basics of Electricity & Magnetism** (2022)
- Secured a **Branch Change** to **Computer Science** department on the basis of academic performance (2022)
- **Awarded fellowship** in the prestigious **KVPY (Kishore Vaigyanik Protsahan Yojna) SX** (2021)

## KEY PROJECTS

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### FastChat

Autumn 2022

Guide: Prof. Kavi Arya | Ongoing Course Project : Software Systems Lab

IIT Bombay

- Developing a messaging software with **end-to-end encryption** by using **RSA+AES** to encode the messages and both **group chat** and **individual chat** support using **python socket library** and **PostgreSQL** database
- Implementing a **load balancer** with **least connect strategy** using **bash** to distribute load among multiple servers. Focusing on obtaining **high throughput** while using only **limited resources** dedicated for the servers
- Used **bash** scripts to simulate common messaging patterns and calculate **throughput** and **latency** of the system

### Lunar Lander using Deep Reinforcement Learning

Autumn 2022

Self Project

- Implemented a **Deep Q learning** algorithm with **experience replay** using **TensorFlow** to train a lunar lander
- Used **Tensorflow Core** to define a **custom loss function** and a **custom training loop** using **GradientTape** to train the model. Used **epsilon greedy policy** to select the action with some amount of random decisions
- **Tuned and optimized model hyperparameters**, including learning rate, batch size, and number of episodes, epsilon, gamma, number of timesteps to achieve the best results and solved the environment within 500 episodes

### Deep Learning and Neural Networks

Autumn 2022

Self Project

- Made a **CNN** to classify images of handwritten digits using **MNIST** dataset and **TensorFlow, Keras and PyTorch** and compared their performance. Also made a **GUI** to draw digits using **python Tkinter** and classify them
- Made many different types of **CNNs** to classify various types of data such as **Traffic signs recognition, Crack detection, Smile detection, Hand sign recognition** using **PyTorch** and **Keras Sequential API**
- Successfully implemented **transfer learning** to train a **pretrained MobileNetV2** to classify images of **alpacs**
- Implemented **ResNet50's architecture** from scratch using **Keras API** and trained it on a hand sign dataset

### Machine Learning

Autumn 2022

Self Project

- Learnt about the various machine learning algorithms such as **linear and logistic regressions, clustering using K-means, K-nearest neighbors and decision trees** and implemented them from scratch using **numpy** and **pandas**
- Proficiency in using **cross-validation and hyperparameter tuning** to optimize machine learning models
- Used **scikit-learn** and **XGBClassifier** and **XGBRegressor** to implement various types of classifiers and regressors to predict and classify various types of data such as **classifying flower species and predicting house prices**

### Rail Planner

Autumn 2022

Guide: Prof. Supratik Chakraborty | Course Project : Data Structures and Algorithms Lab

IIT Bombay

- Developing a railway planner using algorithms such as **Merge Sort, KMP, Quicksort**, etc.
- Utilising Data Structures such as **linked lists, Binary Search Trees, AVL Trees, Hash tables, Tries**, etc.

## TECHNICAL SKILLS

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**Programming Languages:** C++, Python, MATLAB, Java, Bash, Solidity, Sed, AWK

**Software & Tools:** Tensorflow, Pytorch, Keras, Scikit-learn, OpenCV, Seaborn, Git, L<sup>A</sup>T<sub>E</sub>X, MySQL, NumPy, Pandas, Matplotlib, Doxygen, Sphinx

**Web Development:** HTML, CSS, JavaScript, Bootstrap

## EXTRACURRICULAR

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- Successfully completed one year under **National Sports Organization(NSO)** in **Chess** at IIT Bombay (2022)
- Pitched a **Business Model Canvas** for a startup in the health sector which entailed making online ambulance bookings, for the EnB Buzz competition conducted by the **Entrepreneurship cell of IIT Bombay** (2021)
- Participated in a team of 3 and wrote a working script and successful submission in **Google Hashcode 2021**(2021)
- Worked as team of 4 to make a remote controlled bot using ESP32 for XLR8 - an event of **ERC, IITB** (2022)