

# Sampad Kumar Kar

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Portfolio: sampadk04.github.io

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## EDUCATION

- **Chennai Mathematical Institute** Chennai, India  
*M.Sc. - Computer Science; GPA: 9.00; transcript 2022 - present*  
*Notable Coursework:* Advanced Machine Learning, Reinforcement Learning, Mathematical Statistics, Computer Vision, Natural Language Processing
- **Chennai Mathematical Institute** Chennai, India  
*B.Sc.(Hons.) - Mathematics and Computer Science; GPA: 8.82; transcript 2019 - 2022*  
*Notable Coursework:* Calculus, Probability Theory, Linear Algebra, Data Mining and ML

## EXPERIENCE

- **BNY Mellon** Chennai, India  
*Financial Modelling Intern (PPO) May 2023 - July 2023*
  - **Project:** Enhancing Short Term Cash Flow Model
  - **Contribution:** Improved BNY Mellon's STCF forecasting by introducing quantitative methods for identifying seasonal patterns, enhancing accuracy across LOBs and currencies. Conducted statistical tests and modeling to validate the quantitative framework, which was subsequently submitted to Risk for audit and adoption. *Report*
- **Trumpf** Chennai, India  
*Computer Vision Intern Nov 2022 - Apr 2023*
  - **Project:** Sheet Metal Part Identification
  - **Contribution:** Developed a deployable pipeline for sheet metal part identification, using transfer learning on pre-trained models to classify images into 10 predefined categories and output the corresponding CAD files. *Report*
- **Launchpad.ai** Remote  
*Machine Learning Intern July 2022 - Sep 2022*
  - **Project:** Fitness Activity Recognition (in collaboration with Nike)
  - **Contribution:** Collaborated with Cohort'23 to create a model for comparing trainee and expert fitness videos. Utilized 'Dynamic Time Warping' on coordinates extracted via 'Mediapipe BlazePose' to handle variations in camera angles. *Report*
- **Cheenta** Remote  
*Mathematics Instructor Oct 2019 - Apr 2022*
  - **Mathematics Olympiad Instructor:** Taught various courses for Indian National Mathematics Olympiads on various topics like Geometry, Number Theory, Algebra etc.

## NOTABLE PROJECTS

- **Clustering - Fast Text based Clustering:** Developed four clustering techniques, including two optimized versions of sklearn's KMeans and two novel techniques designed from scratch to efficiently cluster large datasets using 'Jaccard Similarity' as the metric. *GitHub* (April '22)
- **Computer Vision - Facial Emotion Detector:** Created a real-time facial expression detector using Deep Residual Networks upon the *Kaggle Facial Expression Dataset*, with deployment for live webcam-based emotion recognition. *GitHub* (Jan '23)
- **Large Language Models - Local GPT for Documents:** Developed a local, internet-independent framework for querying and chatting with users' *Private Documents* in natural language using LLMs, while also identifying document references from the knowledge base. *GitHub* (Aug '22)

## TA EXPERIENCE

- **Chennai Mathematical Institute** Chennai, India  
*Teaching Assistant Jan 2023 - present*
  - **Data Mining and Machine Learning:** Instructors: Prof. Madhavan Mukund, Prof. Pranabendu Misra
  - **Advanced Machine Learning:** Instructors: Prof. Pranabendu Misra
  - **Natural Language Processing:** Instructors: Prof. Ramaseshan Ramachandran

## HONORS AND AWARDS

- Shriram Scholarship (Full Tuition Fee Waiver and Stipend at CMI for Masters) - 2022 - present
- Shriram Scholarship (Full Tuition Fee Waiver and Stipend at CMI for Bachelors) - 2019 - 2022
- NTSE Scholar, INMO Merit Awardee - 2017
- KVPY, RMO, NSEP, NSEA Qualifier - 2017-18
- JEE Advanced AIR **4062**, JEE Mains AIR **3042** - 2019

## TECHNICAL SKILLS

- **Languages:** Python, R, Matlab C++, Java, Haskell
- **ML Frameworks:** NumPy, Pandas, Scikit, PyTorch, transformers, LangChain, NLTK, OpenCV, Matplotlib, Seaborn