Sampad Kumar Kar

Email: sampaddavcspur2001@gmail.com
sampadk04@cmi.ac.in
Mobile: +91-797-8620-354

Portfolio: sampadk04.github.io
Github: github.com/sampadk04
LinkedIn: linkedin.com/in/sampadk04/

Education

- **Chennai Mathematical Institute** — Chennai, India
  M.Sc. - Computer Science; ***GPA: 9.25****; 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, Differential Equations, Probability Theory, Linear Algebra,Theoretical Foundations of ML, Data Mining and ML, Probability and Statistics with R, Linear Programming and Combinatorial Optimisation*
- **Indian Institute of Technology, Madras** — Chennai, India
  B.Sc. - Data Science; ***GPA: 9.2****; transcript* — *2020 - present*
  Notable Coursework: *Programming and Data Structure with Python, ML Foundations, ML Techniques*

Notable Projects

- **Computer Vision - Fitness Activity Recognition**: (Internship Project): Used Google's MediaPipe Pose ML solution with BlazePose to analyze fitness demonstration videos for guided instructions to - 1) recognize classify the exercises on a per frame basis; 2) count the no. of repetitions, using Google RepNet; 3) use DTW (Dynamic Time Warping to compare the trainer videos (experts) to the trainee videos (learners) and output a score. *Blog Report GitHub* (August '22)
- **ToDo WebApp - My ToDo WebApp**: (Flask WebApp): A social ToDo app to keep track of group tasks. In this shared ToDo WebApp, everyone can view the public ToDo List and Add/Update/Delete the tasks. The Heroku deployed version of this app can be found here. *GitHub* (June '22)
- **ANN - Comparison of Regularization Techniques in DNNs**: (Reading Project): Comparative research on several popular regularization techniques using real world weather dataset. Also tested this on their own test set, to validate the conclusions based on training and validation errors, to come up with the best regularization paradigm. *Report* (January '22)
- **Clustering - Fast Text based Clustering**: Developed 4 clustering techniques, two of them based on built-in sklearn 'KMeans', and two new techniques coded from scratch to cluster bigger datasets, all using 'Jaccard Similarity' as metric. Optimised these algorithms to be able to cluster bigger datasets for further semi-supervised learnings. *GitHub* (April '22)
- **Computer Vision - Facial Emotion Detector**: Developed a facial expression detector from scratch using Deep Residual Networks and the Kaggle open-source facial expression dataset. Additionally, deployed the model for real-time rendering to capture human facial expressions in real-time via webcam. *GitHub* (Jan '23)
- **Reinforcement Learning - Playing Super Mario Bros**: (OpenAI Gym): A Reinforcement Learning implementation on the OpenAI Gym environment setup for Super Mario Bros using the PPO (Proximal Policy Optimization) Algorithm. *GitHub* (Aug '22)

Experience

- **Trumpf** — Chennai, India
  Computer Vision Intern — *Nov 2022 - Jan 2023*
  - **Project**: Worked on building a deployable pipeline, to identify 'Sheet Metal Parts' and their types to output their corresponding CAD file.
  - **Contribution**: Used transfer learning on pre-trained ensembles to identify an image as a 'Sheet Metal Part' or not. Then used image hashing and other image processing techniques to classify the identified 'Sheet Metal Part' as one of the 10 pre-defined classes, to output the corresponding CAD file.
- **Launchpad.ai** — Remote
  Machine Learning Intern — *July 2022 - Sep 2022*
  - **Project**: Worked with the Cohort'23 in the project **Fitness Activity Recognition** in collaboration with Nike to develop a generic model to identify and compare the videos of trainee with the expert.
  - **Contribution**: Developed algorithms using DTW (Dynamic Time Warping) to compare videos using the coordinates extracted via Mediapipe Blazepose, while making the comparison robust to difference in camera angles. *Report*
- **Cheenta** — Remote
  Mathematics Instructor (part-time) — *Oct 2019 - Apr 2022*
  - **Mathematics Olympiad Instructor**: Taught various courses for Indian National Mathematics Olympiads on various topics like Geometry, Number Theory, Algebra etc.

TA Experience

- **Chennai Mathematical Institute** — Chennai, India
  Teaching Assistant — *Jan 2023 - Apr 2023*
  - **Data Mining and Machine Learning**: Instructors: Prof. Madhavan Mukund, Prof. Pranabendu Misra, Course Details: This course is an introduction to machine learning techniques including supervised and unsupervised learning, text mining, and additional topics such as probabilistic graphical models and neural networks.

Honors and Awards

- Shriram Scholarship (Full Tution Fee Waiver and Stipend at CMI for Masters) - 2022 - present
- Shriram Scholarship (Full Tution Fee Waiver and Stipend at CMI for Bachelors) - 2019 - 2022
- NTSE Scholar - 2017
- INMO Merit Awardee - 2017
- KVPY Qualifier - 2018
- NSEP, NSEA, RMO Qualifier - 2017-18
- JEE Advanced AIR **4062**, JEE Mains AIR **3042** - 2019

Skills

- **Languages**: Python, R, Matlab C++, Java, Haskell
- **ML Frameworks**: NumPy, Pandas, Scikit, Tensorflow, NLTK, OpenCV, Matplotlib, Seaborn
- **Web Dev**: HTML, CSS, Bootstrap, Javascript, Flask, Jinja2, SQLAlchemy
- **Tools**: Git, PostgreSQL, LaTeX, Excel, SQLite
- **Platforms**: Linux, Windows, Mac
- **Soft Skills**: Leadership, Event Management, Writing, Public Speaking, Time Management