Saransh Chopra

saranshchopra7 | saransh0701@gmail.com | Saransh Chopra | Saransh-cpp | WhiteViolin

Education

Cluster Innovation Centre, University of Delhi — New Delhi, India

B.Tech. Information Technology and Mathematical Innovations | Computational Biology | CGPA: - 9.15 — *2020 – 2024*

Experience

Cluster Innovation Centre, University of Delhi — New Delhi, India

Student researcher — *November 2021 – present*

- Working under Dr. Shobha Bagai to approximate the solutions of partial differential equations using Physics-Informed Neural Networks, Neural Tangent Kernels, and Spatio-temporal Multi-scale Fourier Feature Networks.

AiView — New Delhi, India

Research and Development intern — *September 2021 – November 2021*

- Developed an end-to-end python OCR library with a CI/CD pipeline and deployed it using FastAPI and Heroku.
- Collected a dataset of human images and their distance from the camera by building a stereovision camera.

Google Summer of Code — Remote

Open-Source Developer at PyBaMM, NumFOCUS — *May 2021 – August 2021*

- Built an automated Twitter Bot capable of tweeting random Battery Simulations, and replying to requested simulations.
- Developed a CI/CD pipeline using GitHub Actions and Heroku, and followed a micro-services based architecture.

Publications

T. G. Tranter, R. Timms, V. Sulzer, F. Brosa Planella, G. M. Wiggins, P. Agarwal, **S. Chopra**, S. Allu, P. Shearing, D. J. L. Brett. *liionpack: A Python package for simulating packs of batteries with PyBaMM*. Draft - Drive, GitHub.

Open Source

pybamm-team/PyBaMM | pybamm-team/BattBot | pybamm-team/liionpack | colour-science/colour | lululxvi/deepxde

Projects

SceneNet [Transfer Learning, VGG19, CNNs, Python, Flutter, Dart, FastAPI, Heroku] *December 2021*

- Trained a CNN on 10,000+ images using transfer learning (VGG19) to classify sceneries into 67 categories.
- Developed a standalone API for the model, and a Flutter application for the users.
- Achieved a maximum accuracy of 96% on the test set and 64% on the cross-validation set.

PopItUp [Android, Kotlin, Firebase, Firestore, Google Sceneform SDK, Google ARCore SDK] *May – August 2021*

- An Augmented Reality shooting game developed in native android by manually adding and editing the Sceneform SDK.
- Used the FirestoreRecyclerView to load live data into the leaderboard.

MemeTastic [Flutter, Dart, NodeJS, Elasticsearch, Kibana, CI/CD, Google Cloud, Reddit API] *May 2021*

- The backend, deployed on GitHub Actions, ingests the latest meme data into Google Cloud hosted Elasticsearch.
- The frontend, with a clean UI, pulls the data and provides a feature to search any meme using the ngram analyser.

ChaoticEncryption [Python, ODEs, Encryption-Decryption, Pseudo-Random Number Generator, Matplotlib] *March 2021*

- An Encryption-Decryption script that uses Logistic map and Lorenz System of Differential Equations as PRNGs.
- Along with encrypting images, it also aims to connect chaos, encryption and fractals together.

Relevant Skills and Coursework

Coursework:	Data Structures | Algorithms | PDEs | ODEs | Discrete Mathematics | Linear Algebra | DBMS
Languages:	Python | C/C++| Javascript | Java | Dart | Kotlin
Frameworks/Libraries:	Flutter | ReactJS | ExpressJS | NodeJS | React-Native | Tensorflow | FastAPI | DeepXDE
Platforms and Tools	Linux | Heroku | Google Cloud | Elasticsearch | Kibana | MongoDB | Firebase | Docker | CI/CD
Research:	ANNs | CNNs | PINNs | NTK | SVMs and kernels

Awards and Achievements

Hackathons:	Winner of the Elastic hackathon (out of 2500+ registrations).
Asteroid Discovery:	Discovered an asteroid having a fixed orbit around Sun by analysing the data of Pan-STARRS.
Award:	Faraday Institute's Collaboration Award - awarded to the PyBaMM contributing community.
Talks:	**PyBaMM workshops** - Presented BattBot in front of researchers from around the world. **IIT Madras** - Invited to deliver talks on Python in research and, Git and GitHub.