Shrey Tripathi

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LinkedIn | Github | Portfolio

Objective

Senior at IIITB. My research interests lie in the fields of Software Engineering, Graph Theory, ML and its applications in AI, and Blockchain protocols.

Education

International Institute of Information Technology (IIIT) Bangalore	Aug 2019 – July 2024
Integrated Masters in Technology, Computer Science and Engineering	*CGPA 3.06/4.00*
Airport School, Ahmedabad	April 2017 – May 2019
Senior School (Class XII)	*Aggregate 90.8%*
Airport School, Ahmedabad	April 2015 – May 2017
Secondary School (Class X)	*CGPA 10.00/10.00*

Publications

1. Sharma, E., Chakrabarti, S., [et al, including **Tripathi, S.**] (2022, In press) Automated Application Processing. *Sadhana, Indian Academy of Sciences.* Software Engineering Lab, International Institute of Information Technology Bangalore. arXiv:2204.08695

Research Experience

Accelerating Sparse Deep Neural Networks using GPUs — May 2022 – Present
NSM Nodal Center, IIT Madras
Supervisor: Dr. Vishwesh Jatala

- Developing an algorithm to improve the performance of the inference step in sparse Deep Neural Networks using multiple thread programming for GPUs using CUDA.

Automation of Application Processing using Graph Coloring Heuristics — May 2021 – Mar 2022
Software Engineering Lab (SELab), IIIT Bangalore
Supervisor: Prof. Sujit Kumar Chakrabarti

- We developed an automated process for the processing of applications for recruitment in large organizations, involving two main aspects: panel creation and interview scheduling
- My work involved studying and applying different graph coloring heuristics, including the Chaitin's Algorithm, Ant Colony Optimization, the Genetic Algorithm, Particle Swarm Optimization, etc. to schedule review/interview panels, to optimize the number of slots and schedule quality of different panels.

Capacity Based Access Control for the Indian Urban Data Exchange (IUDX) — Jan 2021 – May 2021
Web Science Lab (WSL), IIIT Bangalore
Supervisor: Prof. Srinath Srinivasa

- Built the first version of a Capacity Based Access Control (CBAC) portal for the Indian Urban Data Exchange (IUDX) platform, based on the Multiverse framework
- Successfully developed the basic functionalities from scratch, like user authentication, world initialization, role selection, role modeling, and role(privilege)-based data access

Work Experience

Tezos India Fellow — Aug 2021 – Oct 2021
Tezos India

- Developed the beta version of a decentralized cryptocurrency safekeeping application on top of the Tezos blockchain, that enables safe and transparent transfer of digital assets to predefined accounts in unprecedented scenarios of loss of private keys or user demise
- Succesfully built the frontend of the application using React, and integrated various end-points of the Smartpy backend with the frontend using the Taquito.js javascript library

Projects

Bias Correction in NWP model | *Python, Flask, Darts, SKLearn* | Presentation, GitHub   Aug 2022 – Aug 2022
- Worked on the project with my team during the Smart India Hackathon 2022, which involved prediction of bias-corrected temperature from the Numerical Weather Prediction (NWP) model, and visualising the same through a web application.
- Observed approximately 100% correction in bias for short durations, and approx. 30 times improvement in RMSE.
- Developed a Flask application to visualize original and corrected values along with bias and error for any location in India, for a duration of 6 months.

AskReddit Troll Question Detection | *Python, SkLearn, NLP* | GitHub   Oct 2021 – Dec 2021
- Used Machine Learning algorithms to produce a model capable of automatically detecting troll questions on AskReddit, one of the most popular subreddits where users ask and answer thought-provoking questions, so that they can be flagged and removed
- Different pre-processing techniques included feature extraction using the bag-of-words model and word embedding using Word2Vec to form context-based vectors, along with stop-words removal, conversion to lower case, punctuation and numerical content removal, lemmatization and stemming, etc.
- Optimized various classification models through hyperparameter tuning to achieve an F1-score of 0.54 for the troll questions with an overall model accuracy of 0.95

Just-post-it | *Django, Javascript, AJAX, PostgreSQL* | GitHub   Aug 2020 – Sep 2020
- Developed a full-stack web-based Twitter-like social networking application.
- Created a Rest API in Django, while connecting it to a PostgreSQL database.
- Used AJAX to implement a single-page application for the front-end that lets users like/unlike posts and edit their own posts in real-time without a page reload.

Depocalypse | *React, Solidity, IPFS, Ethereum* | Project   July 2021 – Aug 2021
- A decentralized NFT marketplace which lets users create their own NFTs and put them up in a marketplace. Functionalities include buying, selling, auctioning, and putting NFTs up for charity
- Contributed to the smart contract that stores NFT objects as structures, mints NFTs on IPFS, and emits events for creation of new NFTs, sale of NFTs and transfer of NFTs from one account to another

CryptoWill | *React, SmartPy, TypeScript* | Project   Aug 2021 – Oct 2021
- CryptoWill lets users store their cryptocurrencies in a decentralized "will", so as to prevent their holdings from becoming dormant in case of loss of private keys or user demise
- Contributed to the front-end of the application by developing the React app with Typescript, and then integrating it with the SmartPy endpoints and contract storage with the Taquito.js Javascript library

Teaching Experience

Teaching Assistant   Aug 2022 – Present
Course: CS303 Software Engineering
Instructor: Dr. Sujit Kumar Chakrabarti

Teaching Assistant   Nov 2021 – Mar 2022
Course: ESS112 Programming - 1 (Python)
Instructor: Dr. Milind Gandhe

Relevant Coursework

Data Science: Machine Learning, Visual Recognition, Mathematics for Machine Learning, Linear Algebra, Probability and Statistics
Computer Science: Programming(C/C++/Python/Java), Software Engineering, Data Structures and Algorithms, Operating Systems, Design and Analysis of Algorithms, Programming Languages, Database Systems, Computer Architecture, Theory of Computation, Computer Networks, Digital Design, Signals and Systems
Mathematics and Basic Sciences: Calculus, Discrete Mathematics, Computational Chemistry, Physics
Social Sciences: Economics, Digital Sociology, History of Ideas, Technical Communication

Technical Skills

Languages: Python, Java, C/C++, Ocaml, HTML/CSS, JavaScript, SQL (MySQL)
Frameworks: Django, Flask, Numpy, Scikit-Learn, PyTorch, Pandas, Jupyter, SASS, Markdown, Bootstrap, LaTeX, Jekyll, JDBC, Servlets
Developer Tools: Git, GitHub, GitHub Actions, VS Code, Figma, Heroku, Docker, Vim

Awards and Honors

2022	Smart India Hackathon Winner, **Ministry of Education, Government of India**
2021	LiFT Scholarship, **The Linux Foundation**
	Tezos India Fellowship, **Tezos India**
2020	Academic Excellence Award (Academic years 2017-18 and 2018-19), **Airport School, Ahmedabad**
2019	Student of the Year (Academic year 2017-18), **Airport School, Ahmedabad**
2017	NTSE Scholarship, **National Council of Educational Research and Training (NCERT)**

Presentations/Talks given

1. "Capacity Based Access Control and the Multiverse Framework"
   Web Science Lab, IIIT Bangalore, 27th April, 2021
   Slides

Clubs and Extracurricular Activities

- **Google Developer Student Club (GDSC) - IIIT Bangalore:** Lead of the GDSC, where we use Google's technologies to spread awareness about open-source in our institute and improve the culture through a community that tries to solve real-world problems that people may face in their day-to-day lives

- **Zense:** Member of the Software Development Club, where I work on and coordinate on various projects undertaken by the club to solve real-world problems

- **Enigma:** Member of the Robotics Club, where I made an autonomous line-follower and an autonomous edge-avoiding robot using the Arduino microcontroller, and am currently studying drone simulations in MATLAB-Simulink

- **Parvaaz:** Team Lead of the Dramatics and Theater Arts Club. Our group act ended up 2nd at Pravega 2020, organized by IISc Bangalore

- **8Bit:** Member of the editorial team of the official magazine of IIITB

- **Yamini:** Anchored Yamini 2019, the annual dusk-to-dawn traditional music/dance confluence organized by SPICMACAY, IIIT Bangalore chapter