Aman Singh

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Education

Arizona State University, MS in Computer Engineering (Thesis) January 2024 – December2025
CGPA: 3.62/4.00
National Institute of Technology Karnataka, B.Tech Electrical and Electronics Engineering July 2018 – April 2022
CGPA: 6.44/10.00

Skills

Programming and Development: C, C++, Python, Java, TensorFlow, PyTorch, Version Control, Git, Web Development, Android, Django, MATLAB
Data Science and Machine Learning: Computer Vision, NLP, Algorithms, Data Structures, Data Visualization, Statistics, Statistical Machine Learning, Probability, Artificial Intelligence, Deep Learning, Forecasting, Reinforcement Learning
Robotics and Miscellaneous PDDL, OOD Detection, Error Detection, Mathematics, ROS, R

Experience

Researcher, MPS Lab, Arizona State University, AZ March 2024 – Current

- Conducting research under **Prof Aviral Shrivastava** focused on improving the **Reliability** of machine learning algorithms by using Neural Activations to detect anaomalies.
- Contributing to the **peer-review process** for conferences such as ESWEEK, IEEE-ESL, ACM-TECS, and RTSS.
- **T**echnologies: **Pytorch, Fault-injection, OOD Detection, Soft error, SDC , Adversarial attacks.**

Software Development Engineer, Amazon, Bangalore June 2022 – March 2023

- Led peak planning initiatives, including scaling factor analysis,**load testing** for **APIs** and **Pollers**, and optimizing AWS resources **Lambda, Kinesis, DynamoDB**. Achieved a **30%** year-over-year **cost reduction** with **1.4x** traffic.Coordinated with dependent and client teams to optimize API latency and manage higher traffic.
- Revamped the migration from gzip to parquet, improving **Athena query latency** by 40% for portal. Designed Adaptive Rate Limiter on the API calls to reduce sudden spikes in latency of apis.
- Technologies: **Java, AWS S3, Lambda, Kinesis, DynamoDB, Glue, Athena** .

Software Design Engineer Intern, Lava International, Bangalore May 2021 – July 2021

- Developed an **automation framework** to automate various test cases at different layers of **Android**.
- Designed a program to check the Bluetooth of android devices by creating an **APK** that automates file transfer between two android devices.
- **T**echnologies: **Python, Java, Android.**

Projects

Fault-Tolerant Neural Networks (Github Link)(Paper Link) August 2024 – October 2024

- Implemented Dr Dna paper(DNNs) to detect Silent Data Corruptions (SDCs), achieving a 100% detection rate
- Employed **PyTorchFI** with a **custom bit-flip function** to simulate single-bit flip faults.Tested across multiple neural network architectures, including **AlexNet**, **ResNet-18**, and **LeNet-5**

Detection of Adversarial and OOD samples (GitHub Link) (Paper Link) Nov 2024 – Dec 2024

- Detected Adversarial and OOD samples in a neural network using **Mahalonobis distance** if the samples from the input classes. Improved the original method by using **voting** based method for detection instead of training another linear regresssion model for **feature ensembling**.
- Achieved a detection accuracy 92 % for both OOD and Adversarial Attack which is very similar to SOTA while significantly reducing runtime overhead.

Achievements

GRE – Total: 317/340, Quantitative: 170/170 2023
Google Kickstart – Rank 1516 in Google Kickstart Round B 2021
International Coding Marathon – Global rank 260 among 1200 participants 2021
Codechef Starters – Global rank **72** among 4900+ participants 2021
JEE Main – Secured **AIR 5398** among 1.5 million candidates in India 2018

Volunteering

Grader, Arizona State University August 2024 – Current

- Assisted in grading assignments, quizzes, exams, papers,and discussion boards for the Electrical Circuits course.
- Ensured timely and accurate feedback to students, contributing to understanding and success in the course.