Vishnu Asutosh Dasu

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Education

Pennsylvania State University — *State College, U.S.A.*

M.S. in Computer Science and Engineering — *Aug. 2022 - May. 2024*

- GPA: 3.95/4.0
- Thesis: Mitigating Unfairness in Deep Learning

Manipal Institute of Technology — *Manipal, India*

B.Tech in Computer Science and Engineering — *Jul. 2016 - May. 2020*

- GPA: 8.71/10.0

Skills

Languages	Python, Java, JavaScript, C, C++, Swift, SageMath, YAML
Frameworks	Django, Flask, Spring, NodeJS, ReactJS, PyTorch, Tensorflow, OpenCV, Numpy, Huggingface, NLTK, OpenSSL, Gurobi, LaTeX
Tools	Docker, Git, Jenkins
Databases	MySQL, Redis

Work Experience

Pennsylvania State University | Research Assistant (NLP and Fairness of ML) — *State College, U.S.A.*

Jan 2023 - Present

- Worked on ensuring neural networks are not biased towards race and sex during classification (fairness of ML).
- Developed an algorithm using Python and PyTorch to modify neuron weights to reduce classification bias, which enables neural networks to be deployed in sensitive socioeconomic use cases.
- Developed an algorithm using Spacy and NLTK for processing raw conversational data that enabled language models to be fine-tuned to function as chatbots for the *Amazon Alexa Prize TaskBot Challenge*.
- Implemented multi-GPU training and inference of the LLaMA language model using Huggingface and PyTorch, which helped in rapid prototyping and lower latency for better user experience while interacting with the chatbot.

Tata Consultancy Services | Security Researcher (Privacy of ML) — *Bangalore, India*

Sep. 2020 - Jun. 2022

- Worked with tech leads from the Security Operations Center on identifying malicious employee behavior from network logs.
- Designed pre-processing algorithms for network logs to ensure they can be effectively utilized by ML algorithms.
- Developed ML algorithms using neural networks to identify insider threats from processed logs, thereby preventing the loss or theft of confidential enterprise data.
- Proposed ML algorithms substantially improved detection rate over the existing algorithm by 2x.

Citrix R&D | Software Engineer Intern (Full Stack and Security) — *Bangalore, India*

Jan. 2020 - Jun. 2020

- Developed interactive dashboards using React.JS that helped customers analyze sensitive data to identify and act upon malicious user behavior in a timely fashion.
- Developed a trust service using Spring to validate API calls to filter unauthorized requests, thereby ensuring application security and data privacy.
- Implemented client-side caching to speed up GraphQL requests by 1.5x which improved user experience and latency and helped reduce server load.
- Configured Jenkins pipelines for CI/CD that improved build times and helped developers identify and triage bugs efficiently.

Nanyang Technological University | Security Researcher Intern (Hardware Security) — *Singapore*

Dec. 2019 - Jan. 2020

- Developed algorithms using C++ and SageMath to generate optimized ASIC implementations of block ciphers.
- Generated and discovered the best-known implementation of the *AES MixColumn* matrix using 12 XOR2 and 47 XOR3 gates.
- Improved gate count over state-of-the-art by 10%, thereby resulting in an efficient hardware implementation of AES.

Tata Consultancy Services | Security Researcher Intern (Robustness of ML) — *Hyderabad, India*

May 2019 - July 2019

- Worked on preventing attacks that exploit CNNs by adding noise to input images to produce misclassification errors.
- Developed an algorithm using PyTorch and autoencoder neural networks to remove adversarial noise added to inputs.
- Proposed algorithm prevented misclassification by retaining 86% of baseline accuracy and helped ensure the robustness of deployed machine learning models.

Projects

CurrenSee | Android Machine Learning Application

- Developed an Android application for *Microsoft Code.Fun.Do* to help the visually impaired make monetary transactions.
- Implemented and deployed an ML algorithm using Python, OpenCV, and Flask to count the value of banknotes from an image.
- Designed an accessibility-focused GUI with an easy-to-use interface and voice commands to aid the visually impaired.

Theia.ai | iOS Machine Learning Application

- Developed an iOS application to aid the visually impaired in traversing external environments by alerting the user of dangerous obstacles.
- Designed an algorithm using TensorFlow and Python for path planning and traversal using the live camera feed.
- Application utilized voice commands and provided real-time low latency responses to minimize the risk of injury.