Varun Ramani

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Education

University of Maryland College Park, MD
B.S./M.S. Computer Science, Minor in Mathematics. GPA 3.9/4.0. *Aug. 2020 – Dec 2024*
***Computer Science Coursework**: Operating Systems, Networks, Compilers, Machine Learning, Data Science, Algorithms/Data Structures*
***Math Coursework:** Signal Processing, Cryptography, Abstract Algebra, Linear Algebra, Statistics, Calculus*

Experience

Naval Research Laboratory Jun. 2023 – Aug. 2023
Software Engineering Intern *Washington, D.C.*
- Revolutionized critical C# RADAR app and accelerated load times by 98% by rebuilding in TypeScript, React, and Mantine.
- Provided military-grade security for app by implementing mTLS-based authentication against DoD common access card.
- Decreased prod. build times by 25% and dev. build times by 99.96% by creating Docker/Python-based build system.
- Reduced network traffic by 20% by analyzing old TCP-based app/server communication protocol and optimizing+rebuilt in JSON/HTTP.
- Furthered productivity during legacy backend development by using Rust to create efficient compatibility layer for new protocol.
- Increased automation by 92% in software installation process by developing modern deployment system using Tauri (Rust/React).

Meta May 2022 – Aug. 2022
Software Engineering Intern *Menlo Park, CA*
- Enhanced Facebook user privacy by using industry-standard hashing techniques to securely anonymize data and simulating impact.
- Optimized core module to realize lower CPU use and billions of saved operations by proving expensive cryptographic step redundant.
- Enabled rapid development iteration by developing bespoke simulation framework; published documentation and training resources.

University of Maryland Aug. 2022 – Present
Teaching Assistant (Data Science / Intro to Computer Systems) *College Park, MD*
- Led discussion sections with up to 40 students, fostering engaging learning environments.
- Mentored numerous students during office hours, clarifying intricate concepts related to C, assembly, and operating systems internals.

The First-Year Innovation & Research Experience @ University of Maryland Aug. 2020 – Dec. 2021
Undergraduate Research Assistant *College Park, MD*
- Developed UNet-based ML model for LIDAR data semantic segmentation, achieving dense point classification within point clouds.
- Demonstrated project outcomes at an undergraduate research summit, showcasing successful contributions to LIDAR data analysis.

Projects & Awards

OccupanSee | devpost:occupan-see | *Computer Vision, React, Python* Apr. 2023
- Improved fire safety in large gatherings by automating overcrowding detection; received award from Bloomberg.
- Applied Facebook Detectron2 model to quickly/accurately count people in webcam feed, then streamed real-time video to React app.

Memaid | devpost:memaid | *Computer Vision, Speech To Text, NLP, Google Cloud, Python, Flutter* Apr. 2022
- Furthered quality of life for dementia patients; received recognition by Google for innovative use of cloud technology.
- When someone introduces themselves to user, Flutter app applies CV/NLP to automatically memorize face/name and store conversation highlights. App relays name and conversation points during next interaction with individual through connected earbuds.

Maskif.ai | devpost:maskif-ai | *Computer Vision, IoT, TensorFlow, Python, Google Cloud* Nov. 2020
- Developed accessible solution enforcing pandemic mask compliance; awarded grand prize at Yale's YHack 2020 hackathon.
- Computer vision intelligently triggers "smart" lock when unmasked individual approaches door; unlocks after individual's departure.
- Leverages Google Assistant SDK to support generic smart locks; fault-tolerant algorithm accurate with lower-quality cameras; efficient neural network performant on standard consumer hardware.

ZConfer | github:varun-ramani/zconfer | *Python, Shell Scripts* Nov. 2020
- Pioneered fast and lightweight system for configuring ZSH developer tool; acquired 26 stars on GitHub.
- Leveraged Python to develop command line tool that automatically generates and manages configuration, in addition to a package/theme management module that supports a wide variety of common ZSH packages.

Technical Skills

Languages: Rust, Python, Java, JavaScript, C/C++, Go, OCaml, Ruby, SQL, MATLAB, HTML, CSS
Frameworks: Flask, React, React Native, Flutter, TensorFlow, PyTorch
Tooling and Systems: Git, AWS, GCP, Docker, Linux
Libraries: pandas, NumPy, Matplotlib