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**, **operating systems**, and **data analysis**.

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

GeekOS | *C* Aug. 2023 – Present

- Implemented crucial **OS** features in **C** as part of UMD's Operating Systems course.
- Added support for pipes, process control, signals, virtual memory (paging) and virtual filesystem.

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.

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
General: Low-Level Systems