

# VARUN RAMANI

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## EDUCATION

### University of Maryland

B.S./M.S. Computer Science, Minor in Mathematics. GPA 3.9/4.0.

College Park, MD

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

### Software Engineering Intern

Naval Research Laboratory

Jun. 2023 – Aug. 2023

Washington, D.C.

- Revolutionized user experience in critical RADAR application; users reported 98% faster load times and 100% of users found rewrite more intuitive to use. Proposed and executed modernization using TypeScript, React, and Mantine.
- Hardened application with military-grade security; implemented denial of access to malicious actors. Leveraged Department of Defense cryptographic infrastructure to authenticate users against their DoD common access card (CAC).
- Renovated team's development pipeline; improved architecture to reduce prod build times by 25% and dev build times by 99.96%. Created Docker/Python-powered build/deployment utility to replace manual RPM build/deploy workflow.
- Achieved improved code maintainability and 20% faster performance by optimizing app/backend communication contract. Analyzed legacy TCP-based protocol with Wireshark; removed redundancies and redesigned atop HTTP + standard JSON.
- Enabled developer productivity while developing against incumbent C++ backend by creating ~1000 LoC compatibility layer for new protocol. Implemented reverse proxy/server running alongside backend; leveraged Rust to minimize performance overhead.
- Ensured seamless software installation for nontechnical end users; increased automation by 92% in software installation process. Developed automatic and modern deployment system using Tauri (Rust/React).

### Software Engineering Intern

Meta

May 2022 – Aug. 2022

Menlo Park, CA

- Enhanced Facebook user privacy while preserving robust ad recommendations; showcased concrete achievements using internal simulations. Used Hack, Meta's internal language, to implement industry-standard hashing techniques.
- Optimized efficiency of core module in advertising backend; realized lower CPU usage and billions of saved operations as proven in weeklong runtime analysis. Mathematically proved redundancy of expensive cryptographic step before eliminating it.
- Enabled rapid development iteration on critical module by developing bespoke simulation framework; published documentation and training resources. Leveraged internal Python dialect as liaison between new system and more generalized simulation tooling.

### Teaching Assistant (Data Science / Intro to Computer Systems)

University of Maryland

Aug. 2022 – Present

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.

### Undergraduate Research Assistant

The First-Year Innovation & Research Experience @ University of Maryland

Aug. 2020 – Dec. 2021

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

### MemaId | [devpost:memaid](https://devpost:memaid) | Computer Vision, Speech To Text, NLP, Google Cloud

Apr. 2022

- Improved quality of life for dementia patients; received recognition by Google at Bitcamp 2022 hackathon for best use of Google Cloud technology and best contributions to social good among 91 other Bitcamp 2022 projects.
- When someone introduces themselves to user, app applies CV/NLP to memorize face after *only seeing it once* and associates with name. Listens to subsequent conversation and stores highlights. On future interactions, app recognizes face and relays name / previous conversation highlights to user through connected earbuds.

### Maskif.ai | [devpost:maskif-ai](https://devpost:maskif-ai) | Computer Vision, IoT, TensorFlow

Nov. 2020

- Developed accessible solution enforcing pandemic mask compliance; ranked first among 42 teams at Yale's YHack 2020 hackathon.
- Computer vision intelligently triggers "smart" lock when unmasked individual approaches door; unlocks after individual's departure.
- Highly cost effective. Leverages Google Assistant SDK to support wide variety of smart locks; fault-tolerant algorithm accurate even with lower-quality cameras; efficient TensorFlow neural network performs well on standard consumer hardware.

## TECHNICAL SKILLS

**Languages:** Rust, Python, Java, JavaScript, C/C++, Go, OCaml, Ruby, SQL, MATLAB

**Frameworks:** Flask, React, React Native, Flutter, TensorFlow, PyTorch

**Tooling and Systems:** Git, AWS, GCP, Docker, Linux

**Libraries:** pandas, NumPy, Matplotlib