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**: Deep Learning, Advanced ML, OS, Networks, Compilers, Data Structures/Algorithms*
***Math:** Signal Processing, Cryptography, Abstract Algebra, Linear Algebra, Statistics, Calculus*

Experience

University of Maryland Aug. 2020 – Dec. 2023
Undergraduate Research Assistant *College Park, MD*

- Developed autoencoder **ML model** for **LIDAR** data segmentation: achieved dense point classification.
- Investigated FMCW **RADAR** implementation using low-cost SDR and directional antennas.
- **IMUOptimize**: Enhanced IMU-based human pose estimation by identifying critical IMUs through **model interpretation** and developed a **transformer-based neural network**, achieving groundbreaking model performance.

Naval Research Laboratory Jun. 2023 – Aug. 2023
Software Engineering Intern *Washington, D.C.*

- Rebuilt C# RADAR app in **TypeScript, React, Mantine**: 98% **faster load times**.
- Implemented mTLS authentication for military-grade security.
- Developed **Docker/Python** build system: 25% faster prod. build, 99.96% faster dev. build.
- Created **Rust-powered** compatibility layer for legacy backend: enhanced productivity.

Meta May 2022 – Aug. 2022
Software Engineering Intern *Menlo Park, CA*

- Enhanced user privacy with secure hashing techniques.
- Core module optimization: reduced CPU usage, **saved billions of operations**.
- Developed simulation framework for rapid development iteration

Projects & Awards

BlockPipe | blockpipe.varunramani.com | ***Language Theory, WebAssembly*** Dec. 2023 – Jan. 2023

- Conceptualized and developed novel **functional language**; built **lexer, parser, and interpreter**.
- Created interactive **demo website**; compiled interpreter to **WebAssembly** and integrated into browser.

GeekOS | *C* Aug. 2023 – Dec. 2023

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

Memaid | devpost:memaid | *Computer Vision, Speech To Text, **NLP**, Google Cloud, Python, Flutter* Apr. 2022

- Furthered quality of life for dementia patients; recognized by Google.
- When meeting someone new, app **memorizes face/name** and stores **conversation summary**. Automatically **recalls/relays** info next time same face recognized.

Maskif.ai | devpost:maskif-ai | *Computer Vision, IoT, TensorFlow, Python, Google Cloud* Nov. 2020

- Developed accessible solution enforcing mask compliance; **grand prize** at Yale's YHack 2020 hackathon.
- **Computer vision** triggers "smart" lock when unmasked individual approaches door; unlocks after they leave.

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