Meenakshi Iyer

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Education

University of Massachusetts, Amherst — Amherst, MA
Honors Bachelor of Science in Computer Science, Minor in Mathematics ***GPA 3.8*** — *Aug. 2022 – Dec 2025*

Experience

Cryptography Research — July 2024-Present
Adam O'Neill — *Amherst MA*
- Implemented existing robust LLM watermarking systems, achieving high detection rates.
- Leveraged advanced cryptographic primitives to enhance watermark security. Employed state-of-the-art machine learning models for effective watermark embedding and extraction.

Research Internship — May 2024 – Aug 2024
TN Tech University, Funded by National Science Foundation — *Cookeville, TN*
- Contributed to Personalized Federated Learning Research with an investigation into security
- Utilized Machine Learning techniques to simulate multiple malicious client attacks, implement Krum defenses, and build a predictive model that decreased Attack Success Rate by over 84%
- Developed and implemented a defense mechanism that kept accuracy within a 5% boundary
- Employed Python, PyTorch, and scikit-learn for model development and experimentation.

Director of Technology — Aug. 2022 – May 2024
FuseUMass — *Amherst, MA*
- Developed Dashboard, an open source Ruby application for hackathon management, used by 1000+ participants annually. Implemented Test Driven Development processes.
- Integrated SendGrid Mailing system. Implemented Azure Blob system to store participant resumes securely. Added HTML/CSS layer for enhanced UI/UX
- Containerized ReactNative and Ruby on Rails systems using Docker Compose to allow for scalability.

Software Engineering Developer — Jan 2024 – May 2024
University of Massachusetts, Amherst — *Amherst, MA*
- Collaborated towards the Full Stack Development of a open source polling app, from design to codebase
- Front end development in React and NextJS using contextualizing techniques to reduce load times for API calls to maximize user reliability
- Back end development in Javascript and SQL, with robust set of API calls that prioritize efficiency in database

Undergraduate Course Assistant — Jan 2024 – Present
Operating Systems, Discrete Math — *Amherst, MA*
- Hosted weekly office hours to help students write low level C++ code simulating Operating Systems topics
- Supported student success by answering questions regarding course content and logistics. Graded 50+ student assignments per week, highlighting room for improvement

Projects

AutoGippity | *Rust, C++, React, OpenAI* — Aug 2023
- Developed a Rust, C++ based bot to write code given natural language input with certain constraints
- Used OpenAI API to process text input and create a web server hosted on localhost, and networking protocol to connect the website and server
- Enhanced accessibility for all users by streamlining execution processes

Pegasus iOS Vulnerability Investigation | *C++, Java, Swift, Git* — December 2023
- Researched Pegasus, an Israeli spyware that jailbreaks iOS devices by breaking ASLR and bypassing pointer authentication
- Analyzed code snippets in JBIG2 PDF Decoder revealing integer overflow leading to arbitrary memory access
- Wrote a 10 page paper explaining the jailbreaking process and associated dangers of Pegasus

DeadlockDetector | *C++, Rust* — September 2023
- Analyzed Banker's Algorithm, an algorithm that simulates resource sharing in Operating Systems by concurrent threads for potential deadlocks. Implemented in Rust for minimized memory leakage and enhanced security.

Technical Skills

Languages: Python, Java, Javascript, C, C++, SQL, HTML, CSS, Rust, MATLAB, LaTeX, Bash
Frameworks: ReactNative, Node.js, FastAPI, AWS, Azure, SendGrid, Next.JS, Material-UI
Developer Tools: Git/Github, Docker, AWS, Visual Studio Code, Linux, Object Oriented Programming
Libraries: pandas, NumPy, Matplotlib