Pratik M. Kamble

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PROFESSIONAL SUMMARY

Ph.D. student in Computer Science at State University of New York researching computer systems security under Prof. Aravind Prakash. Published at DIMVA 2026 on WebAssembly code bloat and attack-surface reduction; currently developing tag-guided forced execution and fuzzing for RISC-V. CTF team captain (13th internationally, MITRE eCTF 2026) and USENIX Security 2026 artifact evaluator.

EDUCATION

State University of New York — **Binghamton, NY**
Doctor of Philosophy in Computer Science — *Aug 2025 – Expected May 2030*
Cumulative GPA: 4.00/4.00

University of Florida — **Gainesville, FL**
Master of Science in Computer Science — *Aug 2021 – May 2023*
Cumulative GPA: 3.80/4.00

University of Pune — **Pune, India**
Bachelor of Engineering in Computer Engineering — *Aug 2015 – May 2019*
Cumulative GPA: 8.37/10.00

TECHNICAL SKILLS

Programming:	C, C++, Python, Rust, Java, Assembly, SQL
Security:	Program Analysis, Binary Analysis, Reverse Engineering, Fuzzing, Software Debloating, WebAssembly Security, Dynamic Coverage Analysis, Secure Protocol Design, Authenticated Encryption
Platforms & Architecture:	Linux, WebAssembly, RISC-V, Android
Frameworks & Tools:	LLVM, GDB, Ghidra, WABT, Wizard Engine, Walrus, Binaryen, Emscripten, Git, Docker

RESEARCH EXPERIENCE

Binghamton University, Research Foundation for SUNY — **Binghamton, NY**
Research Assistant — *Aug 2025 – Present*

- Published at DIMVA 2026: "Dead Weight: Analyzing Code Bloat and Its Security Implications in WebAssembly Binaries," analyzing 8,000+ real-world Wasm binaries and demonstrating measurable security impact of code bloat.
- Combined staged static reachability analysis with dynamic coverage measurement, revealing that 70–85% of functions remain unexecuted under typical workloads despite near-zero provably dead code under conservative static analysis.
- Performed analytical debloating simulation on optimized library binaries, demonstrating 4.9–11.6× reduction in CFI equivalence class sizes, elimination of up to 40.7% of sensitive WASI host imports via dead code, and removal of up to 81% of memory-store and 84% of call_indirect exploitation primitives.
- Developing hardware-assisted forced execution for RISC-V binaries using metadata tags to guide exploration of code paths missed by conventional fuzzing, with integration of coverage profiling and lightweight recovery logic.

University of Florida, The Embodied Learning & Experience (ELX) Lab — **Gainesville, FL**
Research Assistant — *Jan 2023 – May 2023*

- Developed backend API and recommendation engine for an AI-powered web platform supporting student mental health through nature-based mindfulness interventions.
- Built Android application features for an augmented reality mobile assistant for everyday STEM learning.
- Contributed to two peer-reviewed publications: one in the Journal of Hospitality & Tourism Education (AI-supported wellbeing) and one at IEEE VR 2024 (AR-based situated learning).

PROFESSIONAL EXPERIENCE

Vibrent Health — **Fairfax, VA**
Software Engineer — *June 2023 – May 2024*

- Engineered a Kafka-based bulk message interface that improved delivery speed and reduced server load for a precision-health research platform serving NIH's All of Us Research Program and Children's National Hospital.
- Identified and resolved a critical architecture bug causing duplicate records, improving system stability across the platform.

Software Intern *June 2022 – Aug 2022*

- Designed a GitHub API-based security vulnerability detection tool and built web applications using Spring Boot, REST APIs, and JPA/Hibernate.
- Supported deployment workflows with Docker, Kubernetes, and CI/CD for clients including NIH's All of Us Research Program.

Vignet Inc. **Pune, India**
Software Engineer *July 2019 – July 2021*

- Built client-server applications using Java, Spring Framework, and Hibernate for a precision medicine research platform.
- Designed microservices for Fitbit data integration using Spring Boot and Apache Kafka, applying design patterns for reliability and scalability.
- Contributed to SQL-based user migration workflows, supporting third-party data integration into the existing platform.

PUBLICATIONS

- **P. M. Kamble** and A. Prakash, "Dead Weight: Analyzing Code Bloat and Its Security Implications in WebAssembly Binaries," *23rd International Conference on Detection of Intrusions and Malware, and Vulnerability Assessment (DIMVA)*, Chania, Greece, 2026.
- **P. M. Kamble**, "Life Logging: A Practicable Approach," *2018 Fourth International Conference on Computing Communication Control and Automation (ICCUBEA)*, Pune, India, 2018, pp. 1–4, doi: 10.1109/ICCUBEA.2018.8697516.
- Wang, Y. C., Lu, Y., Grunwald, S., Chu, S. L., **Kamble, P.**, and Kumar, J. (2024). "An AI Approach to Support Student Mental Health: Case of Developing an AI-Powered Web-Platform with Nature-Based Mindfulness." *Journal of Hospitality & Tourism Education*, 36(3), 267–280.
- Kulkarni, A., Albright, C., **P. Kamble**, and S. L. Chu, "Investigating Situated Learning Theory Through an Augmented Reality Mobile Assistant for Everyday STEM Learning," *2024 IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops (VRW)*, Orlando, FL, 2024, pp. 955–956.

PATENT

A System and a Method for Performing a User Activity Using an Electroencephalogram (EEG).
The Patent Office, Government of India | Patent Number: **540976** | Date of Grant: **June 6, 2024** | Co-Inventor

- Developed during undergraduate research; presents a method for interpreting user activity from EEG signals.

PROFESSIONAL SERVICE

USENIX Security Symposium 2026
Artifact Evaluation Committee (AEC) Member *Jan 2026 – Present*

- Evaluate submitted research artifacts for reproducibility and research quality as part of the conference artifact review process.

LEADERSHIP & SERVICE

Capture the Flag (CTF) Club **Binghamton, NY**
Team Captain *Jan 2026 – Present*

- Led team to 13th place internationally in MITRE eCTF 2026, designing and attacking secure embedded system and host-device communication protocols.
- Mentor students in embedded security techniques and organize collaborative training that bridges competition experience with systems-security research.

Gator Hatchery **Gainesville, FL**
Consultant *Aug 2022 – May 2023*

- Advised student entrepreneurs on planning and organizing technical aspects of early-stage ventures.

UF Off Campus Life **Gainesville, FL**
Ambassador *Aug 2022 – May 2023*

- Supported student community building through outreach and programming initiatives.