Jay Kania

(609) 509-9264 | jaypkania@gmail.com | linkedin.com/in/jay-kania-0x7 | github.com/jpkOSTEP

Education

Rutgers University – New Brunswick — New Brunswick, NJ
Master of Science, Computer Science — *Jan. 2022 – May 2024*

Gujarat Technological University — Gujarat, India
Bachelor of Engineering, Computer Engineering (with distinction) — *Aug. 2016 – Aug. 2020*

Experience

Rutgers University — Aug. 2023 – May 2024
Instructor (Professor) — *New Brunswick, NJ*

- Instructed "Computer Architecture" to a diverse cohort of 550 students while pursuing a Master's degree.
- Developed programming assignments and complementary auto-grading scripts, ensuring 100% accuracy in evaluations.
- Hosted and managed a high-availability server on the Rutgers iLabs cluster, ensuring reliable access to course material.
- Led and mentored a team of 6 course lecturers, improving instructional consistency and fostering a collaborative teaching environment.
- Taught complex topics such as C Programming, Digital Logic Design, Data Representation and Manipulation, Microprocessor Architecture, Machine Level Programming with x86 Assembly, Memory and Storage Technologies and Hierarchy, and Cache Memory Organization.

Healthcare Technology Startup — May 2023 – Aug. 2023
Full-Stack Developer Intern — *Somerville, NJ*

- Designed and developed a full-stack electronic health record (EHR) application with Angular and Node.js, ensuring HIPAA compliance and handling 1,500+ monthly users, reducing operational costs by $60K/year.
- Built and optimized RESTful APIs, integrating Firebase for real-time data storage and Twilio for notifications.
- Developed a scalable RBAC system for access control and implemented a disaster recovery strategy, reducing downtime risk by 90%.
- Architected a data ingestion pipeline on GCP (Cloud Pub/Sub) to enhance event data collection and monitoring.
- Leveraged Docker for consistent development and deployment, and utilized Redis for efficient data caching, achieving a 50% reduction in data retrieval times and improving overall application performance.
- Enhanced UI/UX with PrimeNG components, improving accessibility and user experience for medical professionals.

Rutgers University — Sept. 2022 – May 2023
Part-time Lecturer (TA) — *New Brunswick, NJ*

- Assisted in Operating Systems Design and Computer Architecture, mentoring students in C programming, x86 Assembly, Memory Virtualization, and Thread Scheduling.
- Distinguished for preserving the highest standards of discretion, honesty, and exemplary job performance.

Technical Skills

Languages: C, C++, Python, Assembly (x86, ARM), Shell Scripting
Frameworks & Tools: POSIX, FUSE, CUDA, MPI, NASM, GAS, GDB, Make, CMake, Docker, Git
Cloud & Systems: GCP, AWS, Vercel, Redis, HPC, Parallel Computing, Distributed Systems

Projects

Drammer: Memory read disturbance attack on Android | *C, C++, Android NDK, Virtual Memory*

- Simulated the Drammer attack to exploit Rowhammer vulnerabilities on mobile platforms, demonstrating significant security risks associated with DRAM memory.
- Developed a robust simulation framework that effectively identified potential bit flips in targeted memory rows.

Memory Management Unit | *C, Linux*

- Devised a user-level MMU that supports 4 GB of address space with 2 level page table supporting different page sizes and reducing internal fragmentation.
- Also, added the software-based TLB cache to improve the performance.

Thread Library and Scheduler | *C, POSIX Thread, Linux*

- Implemented a user-level thread library that supports POSIX thread features and scheduling policy of Shortest Job First(SJF), Multi-Level Feedback Queue(MLFQ) with Round Robin(RR) on Linux.

File System | *C, FUSE, Linux*

- Coded a User level File System of size 512 MB that supports Linux file operations using the FUSE library.

Autonomous Quad-copter | *Machine Learning with OpenCV, Raspberry Pi 4 Model B, related electronic devices*

- Built a 100% autonomous UAV from scratch utilizing Machine Learning with OpenCV for image processing.
- Achieved 95% accuracy in GPS-based route navigation and 98% success in detecting and transmitting human intrusion frames using a Raspberry Pi camera module.

IOT-ised Farm | *C, Advanced CPP, Arduino UNO, SIM-900A, related electronic devices*

- Designed and implemented a smart farm prototype enabling remote control of agricultural equipment via SMS from registered devices (MSISDN), achieving a response time of less than 5 seconds.
- Reduced manual labor by 90% through automation of equipment operations.
- Integrated IoT technology to provide seamless and efficient farm management.

Publications

J. P. Kania, ***"Modern Computer Architecture using different Technique,"*** International Journal of Computer Applications, vol. 183, no. 36, pp. 47–53, Nov. 2021.