Joshua K.A. Cepeda

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Software Engineer, Systems Programming

Software Engineer with over 3 years experience in a fast-paced startup environment. Specializes in C programming in embedded and operating systems contexts. Additional experience with Python for automation and backend web programming.

Technical Skills

- Programming languages: C | C++ | Python | Bash | Shell Scripting
- Test frameworks: Pytest | Criterion
- Operating systems and containerization: Linux | Windows | Ubuntu | RHEL | Docker
- Version control/CI/CD: Git | GitLab CI | GitHub Actions
- Databases: SQL | MySQL | PostgreSQL
- Project build systems: Make | CMake
- Web programming: JavaScript | TypeScript | HTML | CSS | Vue | React
- Web frameworks/servers: Django | NGINX | Flask | Caddy | Swagger/OpenAPI
- S3 cloud storage: Amazon Web Services | Google Cloud Services | Microsoft Azure

Work Experience

Software Engineer **01/2022 - Present**

Private Machines Inc, Brooklyn, NY

- Worked on diverse software projects, incl. frontend web interfaces, backend web proxies, operating systems kernels, embedded firmware, and cybersecurity research
- Implemented 10,000+ SLOC C UEFI bootloader used in over 100 production hardware systems, including features: network boot, firmware integrity verification, and secure BIOS update
- Reverse-engineered baseboard management controller (BMC) firmware to patch security vulnerabilities providing access to server management backplane
- Implemented DRTM (Dynamic Root of Trust Measurement) secure launch environment using C and x86-64 assembly in cybersecurity research funded by Office of Naval Research
- Developed suite of C-based CLI tools for operation of NIST FIPS 140-3 certified secure hardware module
- Maintained high-throughput C-based S3 network proxy application used by major financial services
- Implemented pagination and metrics APIs for Django-based Swagger REST API, speeding up database requests by over 100X

Teaching Assistant **01/2021 - 04/2022**

Notre Dame Computer Science and Engineering Department, Notre Dame, IN

- Tutored students on core computing concepts: multithreading, memory management, networking
- Courses: Operating Systems, Systems Programming

Research Assistant **08/2019 - 04/2022**

Notre Dame Center for Research Computing, Notre Dame, IN

- Performed hardware testing and benchmarking for CERN System-On-Chip interest group
- Ported PetaLinux to ARM-based Zynq System-on-Chip module

Education

Bachelor of Science in Computer Engineering **08/2018 - 05/2022**

University of Notre Dame, Notre Dame, IN

- GPA: 3.6/4.0
- Awarded Trustey Family Merit Scholarship for length of undergraduate degree

Personal Projects

- Personal website deployed on self-hosted Linux server instance, built with Vue

References available upon request.