Yao(John) Xu

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Education

Carnegie Mellon University Pittsburgh, PA
Master of Science in Electrical and Computer Engineering; ***GPA: 3.87/4.00*** *Jan 2023 – May 2024*
Coursework: Operating System Design and Implementation, Parallel Architecture and Programming, Reliable Distributed Systems, Embedded Systems, Computer Systems

The Pennsylvania State University (Schreyer Honors College) University Park, PA
Bachelor of Science in Computer Engineering; ***GPA: 3.88/4.00*** *Aug 2018 – May 2022*
Coursework: Operating Systems, Computer Architecture, Embedded Systems, Computer Vision, Computer Networks, Wireless Communication, Data Structures and Algorithms, Digital Design Using FPGA

Skills

Languages: C, C++, Python, Assembly(x86, ARM, MIPS, RISC-V), Java, JavaScript, SystemVerilog, Bash, MATLAB
Tools: CUDA, OpenMP, OpenMPI, GNU, Git, Linux, FreeRTOS, Vue.js, Spring Boot, AWS, Docker

Experience

NXP Semiconductors Austin, Texas, US
Software Engineering Intern *May 2023 – Aug 2023*
- Developed the **Dynamic Voltage Adjust service** in **C++**, tailored for the **RISC-V power management subsystem's firmware** in the i.MX8ULP SoC, and integrated a compatible interface in the **SDK** using **C**

Tencent Inc. Shenzhen, Guangdong, China
Software Engineering Intern *May 2021 – Aug 2021*
- Engineered a **Python-based automated testing pipeline**, utilizing **urllib3** and **requests**, to optimize the back-end of a **Network Intrusion Prevention System**, achieving coverage for **88%** of test cases
- Developed **Python** scripts for evaluating **packet-blocking** synchronization across LANs via **RPC**, complemented by extensive performance analysis using **wrk2** and **JMeter**.

Projects

A Preemptive User-Level Thread Library
- Developed a **user-level thread library** in **C** featuring **pthread**-like interfaces. Implemented user-space context switching via signal handlers and leveraged **lock-free** queues for management of uthread context data structures

An x86 OS Kernel
- Implemented a UNIX-like kernel with keyboard/console driver, **interrupt** handling, virtual/physical memory management, **task/thread** management, 20+ **syscalls**, round-robin scheduling, and a **user-level** thread library.

RISC-V OS Kernel Rewrite Based on MIT Xv6
- Comprehended and refactored code related to spin lock, timer, UART, virtual/physical memory management, Platform-Level Interrupt Controller, trap handling and process management in the Xv6 kernel.

A Parallel Renderer and Parallel N-Body Simulators
- Developed a **CUDA**-based parallel renderer for generating random circles and snow scenes.
- Implemented parallel n-body simulators based on the Barnes-Hut Algorithm using OpenMP and MPI.

STM32 Embedded Software Development
- Implemented drivers for UART, I2C, keypad, LCD, servo motor, and DC motor on bare metal, along with tasks for keypad input display, servo angle setting, temperature reading with ADC, and motor PID control using FreeRTOS.

Research

A Microscope Camera System for Producing High-Quality Insect Datasets University Park, PA
Undergraduate Research Assistant | Microsystems Design Lab, Penn State University *Jan 2021 – May 2022*
- Publication: Xu, Y. (2022). A Microscope Camera System for Producing High-Quality Insect Datasets.