

Richard Jia

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EDUCATION

University of Illinois Urbana-Champaign

Champaign, IL

Bachelor of Science in Computer Engineering, GPA: 3.93/4.00

Expected May 2026

- Completed Coursework: Data Structures, Algorithms, Probability Theory, Linear Algebra, Digital Signal Processing, FPGA Programming, Operating Systems, Computer Vision, Algorithms for Internet of Things
- In Progress: Stochastic Processes, Distributed Systems, Computer Architecture

EXPERIENCE

Digital Signal Processing Software Intern

May 2024 – August 2024

Astranis Space Technologies

San Francisco, CA

- Designed a software test framework using Python, C++, PostgreSQL, and OpenHTF to automate In-Orbit-Testing (IOT) of satellite payloads, leading to a 80% reduction in test time and fulfilling over \$100 million in contracts
- Analyzed RF sensor data using Numpy, pandas, and statistical models to measure Effective Isotropic Radiated Power of satellite antennas and optimize antenna patterning, reducing patterning time by 60%
- Collaborated with multiple teams to design a secure network infrastructure for IOT, managing SCPI communication over TCP/IP for more than 30 remote hardware devices, reducing configuration time by 50%.

Operating Systems Course Assistant

August 2024 – Present

University of Illinois Urbana-Champaign

Champaign, IL

- Guided over 200 students in building an Operating System from scratch using C and RISC-V, teaching core concepts like paging, scheduling, interrupts, device drivers, and file systems during lab sessions.
- Co-designed course material enabling students to implement the game DOOM using RISC-V and C, integrating OS concepts such as context switching, device drivers, and concurrency into hands-on projects

Research Intern

August 2023 – January 2024

University of Illinois Urbana-Champaign

Champaign, IL

- Conducted experiments with Neural Radiance Fields and Convolutional Neural Networks with PyTorch for 3D reconstruction and generation, utilizing 3D point clouds generated from Structure from Motion as input
- Implemented 3D Gaussian Splatting for real-time rendering leading to a 75% decrease in rendering time

PROJECTS

Operating System | C, x86

- Developed a custom operating system using C and x86 assembly, implementing features such as paging, a read/write filesystem, round-robin scheduling, device drivers, system calls, and interrupt handlers
- Added support for Sound Blaster 16 audio card, VGA graphics, and dynamic memory allocation

Real Time Object Detection and Tracking | Python, OpenCV, Pytorch

- Developed a real-time object detection and tracking system by integrating YOLOv5 with a Kalman filter
- Implemented Kalman filters to estimate and predict object positions and velocities, enabling tracking across video frames during occlusions and partial visibility

DUET Source Separation | Python, Numpy, Scipy, Signal Processing

- Implemented a source separation system using the Degenerate Unmixing Estimation Technique (DUET)
- Utilized the Short-Time Fourier Transform for efficient time-frequency analysis of audio signals. Implemented k-means clustering to separate signals based on time-frequency bins

TECHNICAL SKILLS

Languages: Python, C, C++, SystemVerilog

Technologies and Tools: GIT, UNIX, AWS, PyTorch, PostgreSQL, Numpy, pandas, SciPy

LEADERSHIP AND INVOLVEMENT

UIUC WaggleNet | Project Lead

September 2022 – Present