Shanbo Zhang

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Education

- **University of Illinois Urbana-Champaign** Expected Graduation: May 2026
  Department of Electrical and Computer Engineering, Grainger College of Engineering Cumulative GPA: 3.92
  - Bachelor of Science in Computer Engineering; Minor in Mathematics;
  - Relevant Coursework: **Computer Systems (Operating Systems, Architectures, Their Interactions)**, **Communication Systems (Networking, Signals)**, Distributed Systems, Software Engineering, Linear Algebra;
  - Honors: Engineering James Scholar, Dean's List (Fall 2022 LAS, Fall 2023, Spring 2024)

Skills

- Languages: C/C++, x86, MIPS, (System)Verilog, ARM, Arduino C, Rust, Java, C#, Python, SQL;
- Technologies: Git, Linux, WIN32 API, Espressif, QEMU, FAT32/ext4/NTFS, BIOS/UEFI, Docker, RTOS
- Tools: Microsoft Office, Google Docs, Adobe Premiere Pro, Adobe After Effects, Adobe Photoshop, Adobe Audition

Experience

- **MONET: Multimedia Operating Systems and Networking** Urbana, IL
  Undergraduate Research Assistant (Supervised by Beitong Tian and Prof. Klara Nahrstedt) *Spring 2024 - Present*
  - **MAINTVISION** *Spring 2024 - Present*
    - **Develops an embedded system** in Arduino C++ on ESP32Cam chips for analog gauges from research labs to compute its real-time reading in degree by computer vision achieving **7.5 readings per second with an accuracy of $\pm 1.81°$**; **implements an alert system** for customizable thresholds, improving safety in those labs;
    - **Designs a user interface** enabling live monitoring, chip control (lamp brightness, camera settings, etc.), customizable alert thresholds, and review of generated timing diagrams, improving user experience and system interactivity;
    - **Develops a real-time communication system** in C++ for initialization, transmitting gauge information, alert signals, etc. between the remote server and the chip in MQTT standard, **achieved a reliability of above 99.5%**;
    - **Published in *MIPS 2024:*** *International Conference on Multimedia Information Processing and Retrieval.*
  - **MAINTVISION V2** *Summer 2024 - Present*
    - **Upgrades to an ESP32-S3 chip (with a built-in display) and programs the display** to show the gauge's real-time reading, information, and status on the display, **compatibilizes the system with digital panel**;
    - **Develops and integrates a neural network model into the new chip** to enhance the reading module, making it more robust and efficient with AI-powered capabilities, **expecting to improve the speed by 25%**.

Projects

- **CyanOS** Urbana, IL
  Self-developed GUI Multiprocessing Operating System *Fall 2024 - Present*
  - **Develops essential components for the operating system from scratch**, expecting to **enable about 20 processes to run concurrently**, **supports graphical user interface**, and **implement POSIX functionality**;
  - **Designs a preemptive priority-based scheduling algorithm** to support multitasking on the operating system;
  - Supports the operating system **to reside on multiple popular architectures**, such as x86_64, ARM, and MIPS;
  - **Abstracts multiple popular file systems**, including FAT, ext, NTFS, etc., and both BIOS and UEFI boot modes.
- **IllinixEx** Urbana, IL
  Group-based ECE 391 Course Project: Linux-like Command-line Multiprocessing Kernel *Spring 2024 - Present*
  - **Develops a linux-like interactive operating system** in x86 and C that supports **a maximum of 7 processes runs concurrently**, **more than 20 system calls**, and **more than 5 device drivers** for user programs.
  - **Adds more features beyond the course requirement** to the kernel, such as making file systems nonvolatile, dynamic memory management API, signals, and support of advanced programmable interrupt controller.
- **ScheduleCounselor** Urbana, IL
  Self-developed Desktop Application Managing Schedule & Time Utility *Spring 2024 - Present*
  - **Develops both application logic and user interface** in C++ and Win32 API to memoize user-customized events, alert the user when a event starts, and keep user's concentration through foreground window detection during events;
  - **Provides suggestion and sample timetables** for users by evaluating priorities, categories, and duration of events.
- **Astronomy Society Club** Beijing, China
  Data Science Analysis *Fall 2021 - Summer 2022*
  - **Applied C++ and Python(Pandas) to parse and visualize data** on intensity, frequency, and duration of solar flares **over the past 40 years with average 5000 items per year** and **tried to find potential relationship**;
  - **Applied machine learning models** to predict further occurrences of solar flares and their properties.