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Yuchen You

Education

2024–Present **University of Michigan**, *Ann Arbor, MI, US*,
B.S.E in Computer Science - GPA 3.94/4.00.

2022–2024 **Shanghai Jiao Tong University**, *Shanghai, China*,
B.S.E in Mechanical Engineering - GPA 3.83/4.00.

Research Experience

May 2025–Ongoing **Agentic Distributed System Ops**, Order Lab, Dept. of CSE, Advisor: Ryan (Peng) Huang, University of Michigan.

- Built an **agent-based auto-mitigation** prototype for common distributed failures (overload, network faults).
- Evaluated on **ZooKeeper**; integrated **Prometheus** metrics and mitigation via **HAProxy, Resilience4j**, etc., ChaosBlade and Kazoo fault injection.
- Automated reproduce→metrics of failure→mitigate loop→metrics of recovery.

Sept. 2024–Ongoing **SoftRobot Electronic Control**, HDR Lab, Dept. of Robotics, Advisor: Xiaonan (Sean) Huang, University of Michigan.

- Developed motion planning, state estimation, and pose rendering for modular soft-robotic arm sections.
- Led STM32 & Orange Pi control stack (C++/Rust): dynamics/PID, CAN/I^2C, inter-MCU networking; contributed to PCB design.
- Integrated Python (PyTorch, ResNet) for model optimization; industry collaboration with General Motors.
- Demos/extended abstracts: ICRA 2025 Workshop (Atlanta, **Best Poster**), RoboSoft 2025 Workshop (Lausanne), ICON 2025 (Purdue).

Feb. 2024–Sept. 2024 **Control Developer**, Sirius Lab, Shanghai Jiao Tong University, Advisor: Yutong Ban.

- Objectives: Use the LLM and the Flexiv 7 DOF Robot Arm with ZED Depth Camera to handle natural language input and solve daily tasks like solve the jigsaw puzzles.
- Lead the robotic arm control algorithm design, basing on the Flexiv-RDK frame, use the reverse/forward kinematic solution to make fluent control of the 7 DOF manipulator to handle accurate motion.
- Combining simulation data and path planning into control flow

Selected Projects

Aug. 2025 – Ongoing **CUDA Proxy Player**, *CSE 582 (Advanced Operating Systems)*, Advisor: Ryan (Peng) Huang.

- Built a hybrid runtime reducing CPU launch overhead and tail latency in MoE inference.
- Used **CUDA Graphs** for stable compute replay and a **persistent kernel** for dynamic micro-ops.
- Applied shape bucketing and static memory pools to enable robust graph reuse under varying workloads.
- Achieved lower p95/p99 latency and improved GPU utilization compared to baseline execution.

Aug. 2025 – Ongoing **Simulated Distributed System**, *EECS491 (Introduction to Distributed System)*.

- **Primary-Backup 1-Fault-Tolerant Storage System**
  - Implement with Lexical Confinement design for high concurrency request using Golang.

Jan. 2025 – Apr. 2025 **Simulated Basic Operating System**, *EECS482 (Introduction to Operating System) Lecture Project*.

- **Thread Concurrency Library:**
  - Built a lightweight user-level multicore threading library (swapcontext/makecontext): lifecycle, Mesa Monitors sync (mutex/condvar/spin), interrupts/core-suspend, non-preemptive FIFO run queues.
- **Pager & MMU:**
  - Minimal pager (SWAP/FILE-backed); manages page tables and dirty/reference/recident bits.
  - Page-fault path: clock queue eviction, copy-on-write, defer-and-avoid; supports `fork`/`mmap`/`yield`.
- **Network File System:**
  - Built an inode-based, Unix-style NFS with strong consistency under concurrent access.
  - Synchronized ops (create/read/write/delete) using Boost shared/unique locks; added robust error handling.
- **Linux Kernel Tracing ptrace Optimization**
  - Modified Linux 5.10.224 kernel to add selective memory snapshot, restore, and query support in `ptrace`.

Jan. 2025 – Apr. 2025 **Network Simulation**, *EECS 489: Introduction to Computer Networks*.
- Simulated network topologies in Mininet and measured RTT/throughput with C++ sockets, also reproduce buffer bloat failure in networking.
- Built a video proxy with load balancing and adaptive DASH streaming.
- Implemented a POX SDN controller to mitigate bufferbloat by assigning traffic to QoS queues for latency-sensitive flows.
- Implemented TCP-like reliability over UDP and an L3 router with ARP and ICMP.

Jan. 2025 – Apr. 2025 **Digital Forensics**, *EECS 388 (Introduction to Computer Security) Lecture Project.*.
- **Cryptanalysis & Cracking:** length-extension, padding-oracle; John the Ripper (PDF/ODT), Hydra (SSH).
- **Web Exploitation:** auth bypass via XSS/SQLi/CSRF.
- **Binary Exploitation:** ROP/NOP-sled against DEP/ASLR.
- **Reverse Engineering:** Ghidra decompilation and PWNing.
- **Steganography:** hidden-data detection (binwalk, Stegseek, exif check).
- **Protocols:** TLS 1.3 handshake; Google-style TOTP.

Sept. 2024 – Ongoing **Origami Inspired Soft Robotic Arm: A Modular Design Platform for Manipulation**, *HDR Lab, Dept. of Robotics, University of Michigan*.
- Design Kresling origami and pneumatic-actuation workflow and control algorithms for a confined-space soft robotic arm.
- Led STM32 and Orange Pi firmware development (dynamics, PID, CAN/I²C communication).
- Implemented core algorithms in C++ and Rust; collaborated on PCB hardware design.

2023–2024 **Auto Sentry Robot Control**, *Chinese Univ. National Robot Competition – Robomaster Championship*.
- Autonomous decision making and engagement with dual gimbals and 4-wheel chassis on STM32-F407.
- Lead circuit design; dual-gimbal control stabilization; high-speed 4-wheel chassis response.
- Developed CAN/UART pipelines for CV and LiDAR data; implemented IMU-based absolute-pose control.

Skills

Programming	C/C++, Java, Rust, Golang, Python, Bash; Git; CMake, Makefile, Maven, uv, cargo
Systems	Arch/Ubuntu Linux; concurrency (boost locks); MMU/paging; POSIX sockets (select/poll)
Networking	tc(config); HAProxy; Mininet, POX; TCP (GBN/SR), L3 routing
Distributed	Docker (Compose), Kubernetes; ZooKeeper, HDFS; Prometheus+Grafana (JMX Exporter)
Reliability	Resilience4j; ChaosBlade
Security	Wireshark, Ghidra, John the Ripper, Hydra, sqlmap, Autopsy, Stegseek; ROP chains
ML	PyTorch, CoT
Databases	SQLite, Oracle(SQL*Plus)
Robotics	STM32, FreeRTOS; CAN/I²C; Flexiv RDK; PID/dynamics; C++/Rust firmware, MATLAB
Other	JavaScript, HTML, Markdown, LaTeX; Neovim (LSP via Mason), SSH, tmux, GDB/LLDB

Honors & Awards

May 2025 **ICRA Best Poster Award**, *presented by IEEE Robotics and Automation Society.*
Jun. 2024 **Cheng–Family Scholarship**.
May 2024 **RoboMaster University Championship (Eastern Region Champion)**.
Apr. 2024 **RoboMaster University League (National Champion)**.
Nov. 2023 **University Physics Competition (Silver Prize)**.
Dec. 2023 **SJTU Excellence Scholarship, Level B**.
Nov. 2023 **Wu Jiong Sun Jie Sunshine Scholarship**.
Aug. 2023 **RoboMaster University Championship (National Champion)**.
Aug. 2023 **SJTU Social Practice, Third Prize**.

Extra Curriculars

May 2025-Ongoing **Undergraduate Research Assistant** at University of Michigan College of Engineering, MI, USA

2025 **Volunteer** at IEEE International Conference on Robotics and Automation (ICRA), Atlanta, GA, May 2025

2024 **Teaching Assistant** at Shanghai Jiao Tong University, ENGR 1000J (Introduction to Software Engineering)

2023 UM-SJTU Joint Institute Youth Volunteer Team member (Shanghai, China).

2023 Old Friends Youth Team, Shanghai, Facilitated intergenerational communication activities.

Personal Details

Language English (TOEFL 107/120), Chinese (Native)

Hobbies Badminton, Playing Rubik's Cube, Linux Rice/Customization (especially Arch Linux + Hyprland + NeoVim + Fcitx5), MOBA Games (HOK)