Xiangbo Cai

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Education

Michigan State University *Aug 2023 – Dec 2026*
BS in Computer Engineering, Smart System Concentration

- GPA: 3.916/4.00 (Transcript)
- Dean's List, Dean's Showcase of Stars Scholar, Honors College, Wielenga Scholar, NDE Lab Research
- **Coursework:** Embedded Systems, Digital Logic Design, FPGA & ASIC Design, MCU & MPU ,Computer Architecture, Circuit Analysis, C/C++, Verilog, Signal Processing, Algorithm & Data Structures, Python

Research

Research Assistant *East Lansing, MI*
MSU Non-Destructive Evaluation Laboratory *Oct 2023 – present*

- Conducted research on Non-destructive evaluation (NDE), specializing in electromagnetic sensing and embedded hardware for pipeline inspection under Dr. Yiming Deng
- Designed and implemented PCB-based embedded circuits, performed schematic design, circuit simulations, debugging, and prototyping to optimize sensing accuracy and reliability
- Integrated hardware component into pipeline inspection using CAD software (OnShape & SolidWorks)

Research Assistant *East Lansing, MI*
MSU Department of Computer Science & Engineering *Aug 2024 – May 2025*

- Conducting research in embedded systems and IoT under Dr. Zhichao Cao, specializing in low-power Bluetooth wireless communication and real-time signal processing
- Developing embedded firmware on the nRF52840 platform to collect PDM data via Bluetooth and UART and perform data processing using Python, aimed at real-time Bluetooth audio authentication

Projects

Plowee *github repo*

- Designed and implemented a Raspberry Pi-based GPS tracking system, integrating GPS modules with snowplows to collect and transmit real-time snowplow vehicle location data via Wi-Fi to cloud servers
- Developed Python scripts to parse GPS data and implement communication protocols, resulting in a 20% improvement in data accuracy and transmission efficiency between hardware and software backend
- Tool Used: Python, Raspberry Pi OS, GPS Module, Google Cloud

Pipeline Inspection Robot *github repo*

- Designed and implemented the robot's control system using finite state machine (FSM) modeling and Verilog simulation, achieving a 15% improvement in navigation precision within pipeline environments
- Tools Used: Verilog, NI Multisim, SPICE

Work Experience

Teaching Assistant for MTH103 - College Algebra *Sep 2024 - Dec 2024*

Information Technology Assistant at MSU Surplus Store *May 2025 - June 2025*

LLM AI Chinese Trainer at Outlier *June 2024 - July 2024*

Skills

Skills Proficient: Python | C/C++ | LaTeX | SPICE | Verilog | OnShape | MATLAB | Mathematica | Git