

Xiangbo (Bo) Cai

Okemos, Michigan, USA | (517) 719-2723 | [LinkedIn](#) | caixian3@msu.edu

EDUCATION

Michigan State University – College of Engineering, Honors College	May 2027
<i>Bachelor of Science, Electrical Engineering & Computer Engineering (Double Major)</i>	GPA: 3.9/4.0
Awards: Tau Beta Pi, Wielenga Research Scholar, Winters Research Scholar, Dean's Showcase of Stars	

WORK EXPERIENCE

Non-destructive Evaluation Laboratory	Oct 2023 – Present
<i>Research Assistant</i>	
<ul style="list-style-type: none">Co-authored manuscript under review for journal IEEE Transactions on Instrumentation and Measurement; Research topic received \$250,000+ funding from U.S. Department of TransportationDeveloped an innovative flexible Magnetic Flux Leakage (MFL) method, resulting in higher resolution (<1.5 mm defect detection) and flexible sensing capability on curved pipelinesEngineered a multi-channel sensing electronics system with circuit schematic design, PCB design, and embedded C programming in STM32, enabling real-time data acquisition through Hall sensorsDesigned and 3D-modeled mechanical connector in the MFL system, using SolidWorks and OnShape, creating a flexible joint capable of going across 15+ different geometrically pipeline shapes	
Edge Intelligence and Networking (EIN) Group	Aug 2024 – Apr 2025
<i>Research Assistant</i>	
<ul style="list-style-type: none">Implemented Bluetooth Low Energy (BLE) connectivity on the nRF52840 platform by programming in C++, achieving BLE communication between iOS, Android, and other compatible devicesApplied MATLAB/Python noise cancellation algorithms and signal processing to PDM data, resulting in >15% less noise in recorded audio and improved system stability compared to initial prototype	
Smart Sensing Laboratory	Jan 2025 – May 2025
<i>Research Assistant</i>	
<ul style="list-style-type: none">Curated 2,000+ agricultural images in Roboflow by performing data augmentation and annotation, creating high-quality datasets for training deep learning models in TensorFlow and PyTorchConstructed feedback control systems for an agricultural application by modeling system dynamics and tuning PID parameters in MATLAB/Simulink, producing a 20% improvement in transient response	
Michigan State University	Aug 2024 – Present
<i>Teaching Assistant</i>	
<ul style="list-style-type: none">Served as teaching assistant for core electrical engineering class ECE 202 (Circuits & Systems II) and MTH 103 (College Algebra); Delivered tutoring, graded homework, and exams for 200+ students	

PROJECTS

NDE Pipeline Robotics	Feb 2024 – May 2024
<ul style="list-style-type: none">Designed and implemented NDE robot's control system using finite state machine (FSM) modeling and Verilog simulation, achieving a 15% improvement in navigation precision within pipeline environmentsConducted system-level testing and validation through debugging and adaptive tuning of PID parameters in MATLAB/Simulink, reducing operational errors by 25% and turn results in an SSRN paper	

SKILLS

Programming Language: Python, C, C++, ARM Assembly, MATLAB/Simulink, System Verilog

Hardware: nRF52840, ESP32, STM32, BLE 5.x, RTOS (FreeRTOS/Zephyr), UART/SPI/I²C, Raspberry Pi

Software: Altium Designer, LTspice, SolidWorks, Cadence OrCAD, Git, Linux, Vivado, Keil uVision, LaTeX