

# Nuotianhong Xu

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## EDUCATION

### University of Michigan

*B.S.E. in Computer Engineering & B.S.E. in Robotics*

Aug 2020 – Dec 2024

Ann Arbor, MI

- **Relevant Coursework:** Control of Dynamic Systems, Advanced Embedded Systems, Computer Vision, Autonomous Vehicles, Design & Manufacturing, Linear Algebra, Data Structures & Algorithms, Micro-electromechanical Systems (**GPA: 3.97, Dean's List**)

## RELEVANT EXPERIENCE

### Subaru Research and Development Inc.

*Autonomous Vehicle and Mechatronics Engineer Intern*

Jun 2023 – Aug 2023

Van Buren, MI

- Initiated and orchestrated a \$6000 project, successfully spearheading the development of an innovative active aerodynamic spoiler for a prototype vehicle, enhancing vehicle performance and exceeding expectations for project management efficiency
- Leveraged Python and Embedded C programming with related open-source libraries to interface with industrial PLCs via RS-485 (Modbus RTU) and CAN-bus protocols, resulting in a 10% improvement in control precision and robustness
- Engineered a Simulink four-bar linkage model, establishing a tangible input-output relationship critical for linear rear wing control
- Collaborated closely with colleagues to facilitate fusion of LiDAR and IR cameras in ROS, accelerating the workflow by 50%
- Championed advanced rapid-prototyping techniques like 3D scanning and SLS printing, accelerating my prototype iterations by 30%

### Multidisciplinary Design Program

*Mechatronics & Embedded Systems Engineer*

Jan 2023 – Present

Ann Arbor, MI

- Spearheaded the development of the sensing, control, and actuation system for the automatic driver's door on the Subaru WRX Sedan using ultrasonic sensors and stereo cameras, optimizing user experience and functionality
- Engineered an innovative STM32-based embedded feedback control system, integrating Ethernet communication with the main computing unit, thereby ensuring seamless and efficient data exchange and reducing the computation burden by 25%
- Pioneered the creation and manufacturing of an electromagnetic clutch transmission mechanism, providing the capability for actuator disengagement and manual/powerless door operation, enhancing safety and versatility

### MRacing Formula SAE

*Drivetrain Engineer*

Dec 2021 – Aug 2022

Ann Arbor, MI

- Designed the new outboard planetary gearbox with Siemens NX and gear analysis software Romax that is 5% more compact in size
- Developed the team's automated Gear Design and Optimization Software with MATLAB that shortened the design process by 20 days
- Created a robust Simulink model for the new outboard gearbox prototype to facilitate a more efficient design validation process

## RECENT PROJECTS

### Smart Pill Dispenser

*Embedded System Project*

Jan 2023 - Apr 2023

Ann Arbor, MI

- Developed an STM32-based automatic pill dispenser with SPI touch screen, audio I/O, Bluetooth, and feedback motorized dispensers
- Designed and implemented an iOS mobile application that allows users to upload prescriptions to the embedded system from iPhones
- Optimized the feedback P-I control with four STM32 timers to achieve simultaneous precision control of four pill dispensing motors
- CAD designed and 3D printed the entire low-cost and anti-jam dispensing mechanism with Autodesk Fusion 360 and FDM printer

### Motor-driven Four-bar Linkage

*Mechatronics Class Project*

Jan 2023 - Apr 2023

Ann Arbor, MI

- Led and organized the development of a PID-controlled four-bar linkage mechanism capable of rapidly switching its position and aim between any of the 5 user-defined targets in fewer than 0.25 seconds with 100% accuracy, achieving a class ranking of second place
- Grew acclimation to CAD modeling with SolidWorks, mechanism analysis with Adams, manufacturing with Mill, Lathe, and CNC, programming with Arduino, and professional technical writing and presentation

### Four Function Calculator

*FPGA Design Project*

Sep 2022 - Oct 2022

Ann Arbor, MI

- Devised and implemented a fully-functional four-function calculator as a 32-state Finite State Machine in Verilog HDL that is capable of operating consistently at a clock speed of 50 MHz on a DE2-115 FPGA board
- Improved familiarity in working with finite state machines, complex sequential logic, and RTL design implementation and debugging

## SKILLS AND QUALIFICATIONS

- **Programming Languages:** C / C++ / Python / Swift / LabVIEW / Bash / ARMv7 Assembly
- **Technology:** MATLAB & Simulink / Fusion 360 / SolidWorks / ROS / MSC Adams / Verilog / Altium / LTSpice / Linux / Git
- **Languages:** English (Professional) / Mandarin (Native) / Spanish (Elementary)
- **Others:** Adobe / Microsoft Office / LaTeX / Commercial Driver's License (Class B)