

# Tommy Le

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## Education

<b>M.S. in Mechanical Engineering</b> , Focus in Robotics and Controls Northern Illinois University, DeKalb, IL	Expected May 2024 GPA: 4.00/4.00
<b>B.S. in Mechatronics Engineering</b> , Minor in Electrical Engineering Northern Illinois University, DeKalb, IL	May 2023 GPA: 3.93/4.00

## Experience

<b>Graduate Research Assistant</b> Northern Illinois University   ARM and Omron Lab	Oct 2021 – Present DeKalb, IL
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- Developed software in C and Python to display data from IMUs and a webcam to a web GUI, enabling motor control
- Designed and built a mobile robot and test system in SolidWorks, manufacturing a modular platform for robotics R&D
- Created Extended and Unscented Kalman Filters in C++ to simulate autonomous navigation resulting in 0 mean error

<b>Embedded Systems Intern</b> Yaskawa America Inc.   Motion and Drives R&D Division	May 2023 – Aug 2023 Santa Clara, CA
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- Designed and developed electro-mechanical fixtures and unit test cases, halving firmware release time
- Developed code in C++ and JavaScript for decryption firmware, allowing safe transfer of files across cloud databases
- Automated manual tests checking discontinuities in robot motion profiles in Lua, reducing story points from 4 to 0

<b>Robotics Engineering Intern</b> Argonne National Lab   Robotics and Remote Systems Division	May 2022 – Jan 2023 Lemont, IL
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- Created a VR environment for control of a robot in Python using 3D point cloud data from a Kinect camera and Azure
- Integrated a capacitance skin sensor onto a Robotis electric gripper allowing soft manipulation using PID control
- Developed an algorithm for tactile feedback using accelerometer data to provide synthetic signals to a voice-coil motor

<b>Robotics Engineering Intern</b> PBC Linear   Applied Cobotics R&D Department	May 2021 – Aug 2021 Roscoe, IL
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- Architected an automated trimming system within 1 week to meet demands from a start-up investor, resulting in a 60% cycle time reduction and increased funding for the R&D department
- Improved sales by \$800k by designing grippers and interfacing PLCs and robot work cells, enabling 24/7 manufacturing
- Updated workstations, interfacing electromechanical systems with sensors and actuators, reducing scrap rate by 70%
- Designed a mechatronic smart cart in SolidWorks and prototyped using waterjets, 3D printers, power tools, and welds

## Projects

<b>Master's Thesis: Magnetometer-less Estimation of Mobile Robots using Cascaded Kalman Filters</b>	June 2023 – Present
<ul style="list-style-type: none"><li>• Developed an estimation algorithm for mobile robots using C to interface with motors, an ESP32, IMU, and webcam</li><li>• Created software for PD control, Bluetooth, data collection, and object tracking using MATLAB, C, and Python</li></ul>	

<b>Senior Design: Development and Control of a Small-Sized Spherical Robot V2</b>	Oct 2022 – May 2023
<ul style="list-style-type: none"><li>• Designed and tested a PCB in KiCad allowing for simple motor control interfacing and I2C communication to sensors, shrinking the overall size of the robot and exceeding client requirements by 15 mm in diameter</li><li>• Developed a vision-based control package using ROS, earning the "Innovation in Software and Controls" award</li></ul>	

<b>Automated Quality Control System</b>	September 2021 – December 2021
<ul style="list-style-type: none"><li>• Invented a cobot-compatible automated quality assurance system to load, clean, and measure parts, completely automating the manufacturing process and reducing the amount of scrapped parts per cycle from 8 to 2</li><li>• Integrated an optical micrometer with a PLC, HMI, and linear actuator through Ethernet and I/O ports, allowing the system to communicate states, image capturing protocols, and measurements to a cobot and its operator</li></ul>	

## Skills

**Software:** ROS, SolidWorks, KiCad, LTSpice, LabVIEW, Rviz, OpenCV, Git, Linux, VxWorks, Simulink, ANSYS, COMSOL  
**Languages:** C, Python, C++, MATLAB, JavaScript, CSS, HTML, Lua