Tommy Le

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Education

M.S. in Mechanical Engineering — Expected May 2024
Northern Illinois University, DeKalb, IL — GPA: 4.00/4.00

B.S. in Mechatronics Engineering, Minor in Electrical Engineering — May 2023
Northern Illinois University, DeKalb, IL — GPA: 3.93/4.00

Experience

Graduate Research Assistant — Oct 2021 – Present
Northern Illinois University | ARM and Omron Lab — DeKalb, IL

- Developed firmware 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

Embedded Systems Intern — May 2023 – Aug 2023
Yaskawa America Inc. | Motion and Drives R&D Division — Santa Clara, CA

- 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

Robotics Engineering Intern — May 2022 – Jan 2023
Argonne National Lab | Robotics and Remote Systems Division — Lemont, IL

- 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

Robotics Engineering Intern — May 2021 – Aug 2021
PBC Linear | Applied Cobotics R&D Department — Roscoe, IL

- 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

Master's Thesis: Magnetometer-less Estimation of Mobile Robots using Cascaded Kalman Filters — June 2023 – Present

- Developed an estimation algorithm for mobile robots in C using Eigen, providing localization with +/- 2° accuracy
- Created drivers for inertial and vision sensors, Bluetooth protocols, and motors, allowing trajectory control

Senior Design: Development and Control of a Small-Sized Spherical Robot V2 — Oct 2022 – May 2023

- 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
- Developed a vision-based control package using ROS, earning the "Innovation in Software and Controls" award

Automated Quality Control System — September 2021 – December 2021

- 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
- 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

Skills

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