Tommy Le

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Education

M.S. Mechanical Engineering, Northern Illinois University (NIU), DeKalb, IL — May 2024
Thesis: State-Estimation and Control of a Robot using Cascaded Kalman Filters — GPA: 4.00/4.00

B.S. Mechatronics Engineering, Northern Illinois University (NIU), DeKalb, IL — May 2023
Minor: Electrical Engineering — GPA: 3.94/4.00

Experience

Mechatronics Engineer 2 – Embedded FW, *Lam Research - Robotics Engineering Department* July 2024 – Present
- Developed embedded firmware and control software for robotic and intelligent equipment systems used in semiconductor manufacturing, including robots operating in vacuum environments and smart FOUPs and wafers
- Designed simulation and digital-twin frameworks to emulate sensors, prototype algorithms, validate firmware, replay logs, and detect collisions, high-acceleration events, and performance issues
- Invented a patent-pending panel-centering algorithm achieving <150μm positional error, significantly improving robotic alignment precision while reducing costs
- Implemented advanced control and motion software, including model-based controllers, trajectory generation APIs, and resonance mitigation, decreasing total pick/place overhead and settling time from 2.7 to 1.2 seconds
- Built scalable infrastructure including CI/CD pipelines, client–server architectures, and system-level firmware for sensors, actuators, wireless charging, lighting, cameras, and user interfaces
- Conducted system-level failure analysis and reliability improvements across robotic and intelligent equipment systems, enhancing automation robustness and precision

Research Assistant, *Northern Illinois University - ARM and Omron Lab* October 2021 – May 2024
- Developed a ROS-based vision, state-estimation, and control stack for multi-robot systems, including a cascaded Kalman filter for magnetometer-less pose estimation
- Led end-to-end development of a small spherical robot, spanning PCB design (KiCad), motor control, BLE/Wi-Fi communication in C, bench validation, and system integration

Embedded Systems Intern, *Yaskawa America Inc. - R&D Drives and Motion Division* May 2023 – August 2023
- Automated hardware and motion-control validation by developing Lua test scripts, detecting motion-profile discontinuities, and evaluating communication speed, accuracy, and signal integrity for IO cards

Robotics Research Intern, ***Argonne National Lab - Robotics and Remote Systems Division*** May 2022 – January 2023
- Built a haptic teleoperation system for robotic manipulation, including tactile signal synthesis to emulate surface interactions using sensor data
- Implemented compliant grasping with skin sensing and PID control on a Robotis gripper, allowing for manipulation of soft and malleable objects

Robotics Engineering Intern, *PBC Linear - Applied Cobotics R&D Department* May 2021 – August 2021
- Increased annual sales by $800K by designing and deploying new robotic grippers and fully integrated cobot–PLC work cells, including electrical panel design, wiring, sensor integration (IoT, IR, induction), and control programming

Projects

Computer Vision Based Autonomous Mobile Robot April 2022 – May 2022
- Built a vision-based lane following and obstacle avoidance system for mobile robots using vanishing point detection, color/depth estimation, and PD motor control

Automated Tolerance Testing Station (ATTS) September 2021 – December 2021
- Designed an automated cobot-compatible QA system, integrating an Ethernet optical micrometer with PLC/HMI control to perform multi-stage inspection and tolerance-based robotic operation

Wheeled Robotic Manipulator February 2021 - May 2021
- Built a mobile manipulator, implementing inverse kinematics in C with encoder feedback and Wi-Fi web-based control for autonomous driving and pick-and-place

Technical Skills

Hardware: Microcontrollers, actuators, sensors**,** 3D printers, power/hand tools, welding, soldering, water jet, machining
Software: SolidWorks, Creo, NX, MATLAB, ROS, ROS2, Unreal Engine, Git, OpenCV, Linux, VS Code, Keil IDE
Programming: Python, C, C++, C#, JavaScript, CSS/HTML, Lua, Blueprints