Terry Tao

terrytao19@gmail.com
631-951-7354
terrytao19.github.io/portfolio

Objective

Looking to continue my career by applying experience from Ford, MRacing and personal projects. Seeking to further develop my practical knowledge with strong technical mentorship at an autonomy, controls, or AI focused internship opportunity during spring-summer 2024.

Experience

Ford Motor Company | Allen Park, MI — May 2023 – August 2023
ADAS L3 Self Driving Summer Intern

- Developed a kinematics based model to flag longitudinal Duty of Care (safety envelope) violation events during L3 test drives – safety metric used to compare driving policies
- Automated testing of ECU interface on HIL bench and in-vehicle, worked collaboratively with team to debug at least 3 issues related to CAN message packing, transmitting, gatewaying and receiving – used canalyzer and MATLAB to detect and analyze bugs
- Automated data acquisition and post processing to compare CAN signals with RTK position, velocity on mule F150 and other vehicles with MATLAB / python scripts, and OxTS software suite
- Learned about how large companies manage project timelines – agile, scrum

Education

University of Michigan | Ann Arbor, MI — Aug 2022 – April 2025
B.S. Robotics Engineering
Autonomous Vehicles - Controls with Disturbances, Applied SLAM, Human-Robot Systems

Projects and Activities

(See Portfolio)

(See Youtube)

(See Github)

Formula Electric Racing (MRacing) | Autonomous System — Sept 2022 - Present

- Leading the development of the first ever autonomous car at MRacing, responsible for e-brakes, power steering, safety electronics / radio, controls, onboard perception + reasoning
- Coordinated with other subteams to ensure consistent or improved levels of functionality, serviceability, mass, and speed, while meeting design requirements specified by rules
- Programmed and tuned a SLAM software stack with a ROS architecture, Python and C++
- Implemented Patchwork++ algorithm for online LiDAR ground segmentation and developed a custom nearest neighbors based cone clustering algorithm, custom LiDAR-camera fusion
- Trained a custom YOLO object model for traffic cone detection and perspective mapping
- Managed sponsorships from autonomy focused companies for hardware components
- Oversaw acquisition of over $40,000 worth of sensor / computer hardware from sponsors

FIRST Robotics (FTC) | Team President — 2018-2022

- Ranked top 40 internationally at Maryland Tech Invitational – led the team to success
- Programmed a triple dead-wheel odometry localizer in Java to perform manipulation tasks fully autonomously and optimized pose trajectories (x, $\dot{x}$, $\ddot{x}$), state machine based proprioception
- Iteratively Designed mechanisms in Fusion and Solidworks to manipulate small plastic objects efficiently (grippers, conveyors, linear slides, drivetrain, etc.)

Stewart Platform — 2021

- Designed, built, programmed a 6-DOF parallel manipulator, rotating base joints
- Developed kinematics and dynamics control model on microcontroller – embedded C
- Implemented IMU acceleration dampening on end effector – applications in offshore platforms

Other — 2019-2021

- Designed and built a custom dual-nozzle 3D printer to print dissolvable support material
- Developed silicone tether-less pneumatic artificial muscles for a regional ISEF competition

Skills

Programming:
Java | Python | C++ | OpenCV | ROS | Julia | Git | MATLAB | Pytorch | R | Simulink | LaTeX
Software:
Solidworks | Siemens NX | Fusion 360 | OxTS | Kernel | YOLO | Jetson OS | Canalyzer | Ubuntu
Communication:
CAN-HS | CAN-FD | I^2C | SPI | UART | RTK GNSS (RTCM) | UDP | SSH
Fabrication / Other:
Fiber laser |CO2 laser | Waterjet | GTAW | FDM | Wire harnessing | Camera-Lidar extrinsic calibration

Other

Michigan Climbing Club — 2022-Present