Terry Tao

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About

Looking for internship: spring-summer 2024. Dates available: May 1st 2024 – August 20th 2024.
TLDR; I am very good at ROS, MATLAB, perusing Github, and using google keywords.

Experience

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

- Developed a kinematics-based model to flag Duty of Care (safety envelope) violation events during L3 test drives – safety metric used to compare different driving policies
- Using MATLAB, Vector tools, and python, automated testing of ECU interface on HIL bench and in-vehicle, fixed issues related to CAN message packing, transmitting, gatewaying, and receiving
- Automated data acquisition and post processing to compare CAN logs with RTK position and velocity on mule F150 and other vehicles with MATLAB, python scripts and OxTS software

Education

University of Michigan | Ann Arbor, MI — Aug 2022 – April 2025
B.S. Robotics Engineering
Aero AV - Controls with Disturbances, Applied SLAM, AV Startup Class, Pursuing sequential M.S. 2026

Projects and Activities

(clickable on pdf)

Portfolio

Youtube

Github

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

- Leading the development of the first ever autonomous car at MRacing, responsible for onboard perception + reasoning, controls, safety electronics / radio, e-brakes, power steering
- Using ROS, C++, Python –> Linearized dynamics for EKF state estimator (INS + camera fusion)
- Trained custom YOLO model for 3D cone detection + mapping –> converted to TensorRT
- Managed sponsorship of over $30,000 worth of sensor / processing hardware from sponsors

Ground Effect Plane Controls | Class Project — 2023-Present

- Used MATLAB and Simulink to create a 6DOF EOM solver with additional ground effect dynamics
- Designed decoupled altitude, airspeed, and heading controllers, tuned nested PID controllers
- Applied waypoint following, result is a plane capable of navigating any set of waypoints in order, at a setpoint altitude of 5m above water under reasonable wave and wind disturbances

SLAM Robot| Class Project — 2023-Present

- Tuned wheel velocity PID and trajectory following PID, applied differential drive wheel odometry
- Applied action model state estimator, LiDAR occupancy grid mapping, particle filter for fusing
- Applied A* path planning and frontier exploration to automatically map new environments

MCity Startup Research — 2024-Present

- Working with Buyutech to develop passive-only detection and ranging; 2 semester design project

Stewart Platform (6DOF parallel manipulator) | Personal Project — 2021

- Embedded C: position control of end effector using microcontroller – PID, inverse kinematics
- IMU lateral acceleration dampening and angular setpoint following on end effector – see website

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

- Used Java: programmed odometry, optimized trajectories. Used Fusion, Solidworks + 3DP

Custom 3D printers | Personal Project — 2018-2022

- Bought Ender 3 -> Built custom dual nozzle core-xy -> Built + modded Voron 0

F1Tenth| Personal Project — 2023-Present

- We are trying to make an RC car drive sideways on two wheels, since it would be funny.

Skills

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