

Tyler Smithline

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EDUCATION

University of Michigan, Ann Arbor

M.S. IN ROBOTICS, FOCUS IN DEEP LEARNING & COMPUTER VISION

Expected Graduation May 2025

GPA: 4.0/4.0

Coursework: Machine Learning, Deep Learning for Robot Perception, Robot Learning for Planning and Control, Computer Vision, Graphics & Generative Models, Self-Driving Cars, Robotic Systems Lab, Math for Robotics

University of Illinois Urbana-Champaign

B.S. IN MECHANICAL ENGINEERING, MINOR IN COMPUTER SCIENCE

Graduated May 2023

GPA: 3.9/4.0, Highest Honors

Coursework: Robot Dynamics and Control, Data Structures and Algorithms, Computational Photography, Applied Machine Learning, Computer Control of Mechanical Systems, Signal Processing, Dynamics of Mechanical Systems

RESEARCH EXPERIENCE

Image Segmentation from Sonar

FIELD ROBOTICS GROUP, UMICH | AUG 2024 - PRESENT

- Developing a deep learning pipeline for semantic segmentation of shipwrecks from multi-beam sonar depth data
- Investigating methods of using synthetic data and augmentations to improve performance with limited data
- Improved training efficiency using Docker for modular deployment across servers and CUDA for GPU acceleration

Vision-Based Balance Assessment

STIRLING RESEARCH GROUP, UMICH | JAN 2024 – MAY 2024

- Designed and implemented a convolutional neural network using PyTorch to assess balance from video data
- Optimized model performance by leveraging cross-validation for evaluation and fine-tuning of hyperparameters

WORK EXPERIENCE

MathWorks | SOFTWARE ENGINEERING INTERN

Natick, MA | May 2024 - August 2024

- Developed a MATLAB tool that constructs GPS messages according to industry-standard formatting requirements
- Revamped test suite to improve efficiency, achieving an 80% reduction in runtime while preserving test coverage
- Led initiative to migrate Gazebo simulation test suite from a VM-based to a Docker-based workflow

Tesla | TEST ENGINEERING INTERN

Palo Alto, CA | Spring 2021, Summer 2023

- Created a Python pipeline to digitally filter out signals outside of a desired frequency range and attenuate noise
- Initiated the design and prototyping of a non-destructive crack measurement device utilizing the AC Potential Difference method, conducting measurement sensitivity and power output testing to validate equipment

J&J Surgical Robotics | MECHATRONICS INTERN

Santa Clara, CA | May 2022 – Aug 2022

- Led the design and development of the mechanical, electrical, and control systems for a lifecycle testing fixture
- Utilized Arduino to integrate a suite of sensors, actuators, and user controls into a reliable test setup

PROJECTS

3D Reconstruction & Volume Rendering

GRADUATE COURSE PROJECT | SPRING 2024

- Created NeRF model from scratch capable of synthesizing photorealistic novel views of complex 3D scenes
- Implemented a simplified Gaussian Splatting method, optimizing model to accurately render images of 3D scenes

Autonomous Mobile Robot

GRADUATE COURSE PROJECT | FALL 2023

- Developed a SLAM algorithm using a particle filter and 2D LIDAR for real-time occupancy grid mapping in C++
- Designed and implemented an A* path planning algorithm for efficient obstacle avoidance in maze navigation

5-DOF Robot Arm Manipulation

GRADUATE COURSE PROJECT | FALL 2023

- Utilized inverse kinematics and motion planning algorithms to autonomously stack objects within a 3D workspace
- Used April Tags to calibrate intrinsic and extrinsic camera parameters for pixel-to-world coordinate conversion

SKILLS

Robotics: Computer Vision, Machine Learning, Robot Dynamics & Kinematics, Motion Planning, PID, LQR, State Estimation

Programming Languages: Python (PyTorch, Numpy, SciPy, OpenCV, Pandas), C/C++, MATLAB, Java, Arduino, VBA, R

Software Frameworks & Tools: Robot Operating System (ROS), Git, Linux, Docker, CUDA, Cloud Computing