

# HARRISON CHEN

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Robotics software engineer with experience in developing and integrating navigation, mapping, and perception algorithms for mobile robotics systems. Proficient in programming with C++ and Python, as well as robotics-specific libraries such as ROS and Eigen. I am a self-driven learner who enjoys tackling complex challenges, especially in a collaborative manner. My goal is to leverage my skills and knowledge to build technologies that make a positive impact.

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## EXPERIENCE

**PDW**, New Rochelle, NY

Mar 2022 – Jan 2025

*Autonomy Engineer*

- Augmented quadcopter's autonomous navigation stack with trajectory generation capable of obstacle avoidance and breadth-first search for safe start and goal positions, increasing safety and reliability while flying
- Modularized navigation pipeline to accommodate multiple flight modes with unique implementations, improving code abstraction and ease of adding future algorithms
- Integrated multi-sensor OctoMap and Voxelblox 3D mapping algorithms into mapping ROS package, allowing drone to map 3D occupancy by combining input from forward- and downward-facing RealSense cameras
- Evaluated stereo depth DNNs on Arducam sensors in search of learning-based vision alternatives using Nvidia TAO Toolkit and MATLAB Deep Learning Toolbox for model modification and tuning

**Jugaad Labs**, Philadelphia, PA

Mar 2021 – Mar 2022

*Robotics Engineer*

- Contributed to development of automotive situational awareness system for semi-trucks, using Python and ROS to identify and monitor nearby vehicles using center point-based object detection and Kalman filter tracking
- Built application with Nvidia Isaac SDK to perform object detection on camera feeds in Isaac Sim warehouse environment, serving as a theoretical sensing foundation for autonomous logistics

**FANUC America**, Rochester Hills, MI

Jun 2020 – Aug 2020

*Applied Product Development Intern*

- Strengthened functionality for ArcTool recovery mechanism using proprietary programming language Karel, enabling welding robots to recalibrate in any reachable end effector pose

**Robotic Systems Laboratory Course (ROB 550)**, Ann Arbor, MI

Jan 2020 – May 2020

*Student / Team Member*

- Implemented a simulated SLAM robot in C++ with 2D occupancy grid mapping, odometry motion model, beam measurement model, Monte Carlo localization, and A\* path planning
- Collaborated with teammates on the development of an inverted pendulum robot using C and RCL, including PID control for balancing, manual steering via joystick, and autonomous movement along series of waypoints

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## EDUCATION

**University of Michigan**, Ann Arbor, MI

Dec 2020

*Master of Science in Robotics*

- **GPA: 3.96/4.00**
- Relevant coursework: Mobile Robotics, Deep Learning for Computer Vision, Robot Modeling and Control

**Northwestern University**, Evanston, IL

June 2019

*Bachelor of Science in Mechanical Engineering*

- **GPA: 3.80/4.00**
- Relevant coursework: Advanced Mechatronics, Feedback Systems
- Activities: Education Chair @ Refresh Dance Crew, Social Chair @ Chinese Students Association, Tau Beta Pi

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## SKILLS & INTERESTS

**Programming:** C++, Python, MATLAB, Bash, Git

**Robotics:** ROS, Eigen, OpenCV, PCL, PyTorch, 3D geometry, kinematics, Bayesian statistics, sensor calibration

**Interests:** soccer, running, dance, cooking, environmental conservation