Kyle Wang

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EDUCATION

Northwestern University **Evanston, IL**
M.S in Robotics *Sept 2023 - Dec 2024*

Case Western Reserve University **Cleveland, OH**
B.S.E in Electrical Engineering, Concentration in Robotics *Sept 2020 - May 2023*

SKILLS

Robotics: ROS/ROS2, SLAM, Robot Kinematics, MoveIt, Path Planning, Feedback/Control Systems, AprilTags, RVIZ, Simulation, Gazebo, CoppeliaSim, Mechatronics, Embedded Systems, Microcontrollers, Quadcopters
Machine Learning: PyTorch, Reinforcement Learning, Imitation Learning, Diffusion Policy, Computer Vision, OpenCV
Programming: C++, Python, C, Git, Linux, Ubuntu, Bash, Unit Testing, CMake, AWS, MATLAB, Django, Java, Bazel

EMPLOYMENT

Astranis - Hardware Integration / Production Software Engineer **Jun - Sep 2024**
- Automated hardware testing of various satellite subsystems using Python and Google's OpenHTF package
- Automated environment chamber and thermal chamber testing for various satellite subsystems
- Redesigned company's OpenHTF tutorial by creating simulated flight cameras to address a lack of hardware

Cleanr - Innovation Engineer **Mar - Aug 2023**
- Built a data logger system and website with NI DAQmx and GWeb to allow real-time and historical data access
- Prototyped an RFID-based tracker with an Arduino and RC522 RFID Sensor for disposable washing machine pods
- Collaborated with other engineers to prototype a custom microcontroller board with a STM32 chip for production

PROJECTS

Shepherding Model from Human Behavior (NSF Grant 2024774) **Mar - Present**
- Implemented a Python pipeline utilizing diffusion policy to develop and assess multiple shepherding models
- Created a Python PyGame simulation and applied the Strömbom shepherding model to collect human data

Autonomous Drone Swarm for Light Painting **Jan - Mar 2024**
- Designed a Python pipeline leveraging OpenCV Canny Edge Detection, Nearest Neighbors Algorithm, and a motion capture system to generate a series of waypoints for drones to navigate through
- Developed multiple ROS2 Python packages and nodes for controlling a DSLR Camera, wrapping the Crazyswarm2 API, flying multiple Crazyflie 2.0 drones, and toggling each drone's onboard status LED

Simultaneous Localization and Mapping (SLAM) From Scratch **Jan - Mar 2024**
- Implemented an Extended Kalman Filter (EKF) SLAM algorithm from scratch in C++ using LiDARs and encoders
- Built a C++ Library for robot control, differential-drive robot kinematics, and odometry
- Deployed algorithm on a custom simulation environment and on the Turtlebot3

Robot Arm that Makes Coffee **Nov - Dec 2023**
- Led a team of 5 students to program a 7 DoF Franka Emika Panda robot arm to brew pour-over coffee in Python
- Utilized ROS2, OpenCV, AprilTags, and various features of MoveIt including path constraints and inverse kinematics
- Acted as the Reliability Engineer by isolating and testing various subsystem functionalities such as calibrating and refining a pouring algorithm in an RVIZ simulation environment and on a physical robot

Mobile Manipulation Simulation with CoppeliaSim **Nov - Dec 2023**
- Simulated a mobile robot with Mecanum wheels and a 5 DoF robotic arm in CoppeliaSim
- Generated a trajectory to manipulate a block, deploying feed-forward control and a PI controller in Python

Eagle Scout, Boy Scouts of America **Oct 2019**