

MIN KYU KIM

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EDUCATION

University of Michigan <i>M.S. in Robotics</i>	Aug. 2024 – May. 2026 GPA: 4.0/4.0
University of Illinois at Urbana-Champaign <i>B.S. in Mechanical Engineering, Minor in Computer Science</i>	Aug. 2020 – May 2024 GPA: 3.93/4.0

EXPERIENCE

Honda Research Institute (Industry-Sponsored Research) <i>Graduate Student Researcher</i>	Sep. 2025 – Present <i>Ann Arbor, MI</i>
<ul style="list-style-type: none">Leading confidential industry project to improve perception/localization in unstructured marine environmentDeveloping real-time Visual-LiDAR 3D pose estimation pipeline in C++, enabling precise landmark localization for relative navigation tasksDeploying robust GPS/IMU fusion localization pipeline, implementing an active heading correction mechanism based on an Invariant EKF to resolve fundamental yaw unobservabilityImplementing rigorous spatiotemporal calibration and synchronization for multi-modal sensor fusion	
Computational Autonomy and Robotics Laboratory <i>Graduate Research Assistant</i>	Jul. 2025 – Present <i>Ann Arbor, MI</i>
<ul style="list-style-type: none">Developed a landmark-based pose-graph SLAM system utilizing GTSAM for backend optimization, integrating semantic segmentation outputs with multi-modal sensor data (LiDAR, Camera, IMU, GNSS)Automated data pipeline using SAM 2 to bootstrap datasets, modifying temporal tracking logic to auto-propagate labels for YOLOv11 trainingConducted feasibility analysis of monocular depth estimation (Depth Anything V2), benchmarking metric calibration against LiDAR ground truth to validate performanceValidated navigation performance in Gazebo and on an autonomous vessel powered by NVIDIA Jetson Orin	
Amazon Robotics <i>Robotics System Engineer Co-op</i>	Jan. 2025 – Jun. 2025 <i>North Reading, MA</i>
<ul style="list-style-type: none">Led on-site integration for a \$10M outbound dock automation retrofit, coordinating 25+ staff to deploy the autonomous mobile robot (AMR) fleetExecuted robot deployment tests (QA, sensor validation, performance testing) across 3+ Amazon warehousesCollected data and summarized failures to unblock operations and inform follow-up tests with engineering teamsAuthored technical documentation to standardize deployment, enabling scaling from beta to all Amazon sites	

PROJECTS

Exposure-Robust Masked ORB-SLAM3 <i>Python, C++, ORB-SLAM3, OpenCV</i>	2025
<ul style="list-style-type: none">Engineered a lighting-invariant frontend for ORB-SLAM3 using adaptive gamma correction and exposure-aware masking to filter unstable keypointsAchieved a 9x reduction in trajectory error (RMSE) on nighttime datasets while maintaining real-time performance with only 30ms latency overhead	
TEM Cell Segmentation using Deep Learning <i>Attention U-Net, PyTorch, HDF5</i>	2025
<ul style="list-style-type: none">Developed a multi-class semantic segmentation pipeline using an Attention U-Net, utilizing sliding-window inference to process high-resolution scansOptimized a hybrid Cross-Entropy and Dice loss function to resolve class imbalance, achieving a 0.79 mean Dice score on validation sets	
MBot Autonomous Navigation <i>C++, ROS 2, LiDAR</i>	2024
<ul style="list-style-type: none">Engineered a custom Monte Carlo Localization (MCL) particle filter in C++, generating high-fidelity occupancy grid maps from raw 2D LiDAR scansIntegrated A* path planning and frontier-based exploration with a PID motion controller to enable fully autonomous mapping of unknown environments	