DAMIEN KOH

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EDUCATION AND SKILLS

Northwestern University, Evanston, IL *Sep 2023 – Jun 2025*
Master of Science in Computer Engineering *Cum. GPA: 3.93 out of 4.0*

Northwestern University, Evanston, IL *Sep 2021 – Jun 2025*
Bachelor of Science in Computer Engineering, Academic Honor Society of IEEE (Eta Kappa Nu) *Cum. GPA: 3.93 out of 4.0*

Skills
ROS, ROS2 | Git | Linux | C, C++, CMake | Python | MATLAB | Embedded Design & Programming (EAGLE & Microchip Studio) | Feedback Systems | Machine Learning, Deep Learning (PyTorch, Isaac Gym) | Computer Vision (OpenCV) | Motion Planning, SLAM

WORK EXPERIENCE

NU Center for Robotics and Biosystems, Matthew Elwin's Lab *Jun 2023 – Aug 2023*
Robot Development, Research Assistant
- Developed ROS2 Unified Teleop package in C++ to enable versatile teleoperation for a variety of robots using any input device.
- Designed configurable input/output schemes and integrated advanced control features like Rate of Change and Spherical Boundary Radius, ensuring broad device compatibility and tailored robot movement; enabled varied control modes to enhance robot precision.

Weston Robot (www.westonrobot.com/) *Jun 2022 – Aug 2022*
Robotics Intern
- Developed a Trash-Picking Robot with a team, capable of patrolling an area for trash and disposing of it; developed robot arm and navigation control software in C/C++ and Python using ROS 1 and MoveIt (Demo: www.youtube.com/watch?v=fR2VynbYyuk).
- Implemented Machine Learning and Computer Vision alongside peers using YoloV5 for object detection.

Mandatory National Service - Singapore Armed Forces *Jan 2019 – Nov 2020*
Army Intelligence and Reconnaissance Officer (Lieutenant)
- Served as Deputy Intelligence & Security Officer of 16th Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance Battalion (16 C4I Bn). Attended the Battalion Advanced Intelligence Analysis Course and Officer Cadet School.

STUDENT PROJECTS & ORG INVOLVEMENT

RGB Data Fusion for Deep Learning in Isaac Gym *Apr 2024 – Present*
- Integrating RGB data with existing multisensory input model for Isaac Gym to enhance Unitree's dog parkour ability in extreme terrain.

EKF SLAM Turtlebot *Jan 2024 – Present*
- Developing an Extended Kalman Filter (EKF) SLAM algorithm on a Turtlebot to enable accurate mapping and localization in dynamic environments using ROS2 and C++; solving data association in SLAM to improve navigational accuracy with laser scanner integration.

Omnid Mocobot Software & Demo Lead *Feb 2023 – Mar 2024*
- Developed teleoperation for Northwestern's Omnid research platforms, enabling studies in human-robot collaboration & manipulation.
- Implemented Lifecycle Node functionality and Rviz visualization in C++, enabling dynamic control mode selection and diagnostics.
- Directed software & demo development for MARS (Machine Learning, Automation, Robotics, Space) conference hosted by Jeff Bezos.

Translator & Writing Robot - PolyglotBot *Oct 2023 – Dec 2023*
- Developed an autonomous system in Python translating written phrases and writing them onto a whiteboard with a Franka Robot Arm.
- Implemented a custom ROS MoveIt library, AprilTag functionality, and OCR & Translation APIs; Guided team's git workflow.

Autonomous Exploration Robot *Nov 2023 – Dec 2023*
- Programmed a virtual robot for autonomous exploration in a simulated environment using Frontier Exploration in Gazebo, developing a custom ROS node in Python for dynamic navigation and terrain mapping; providing an introduction for autonomous navigation.

Gesture Tracking Glove Prototype *Apr 2023 – Jun 2023*
- Developed a gesture-tracking glove with a custom PCB, using ESP32 and FreeRTOS for dual-core concurrency, and integrated it with 6 DoF sensors and flex sensors for real-time visualization on web platforms; Utilized electrical lab equipment and logic analyzers.
- Employed Edge Impulse for machine learning gesture recognition and optimized sensor data with algorithms like Madgwick's filter.

Red Dot Link (https://reddotlink.com/) *Jan 2024 – Present*
Co-Founder, Chief Operations Officer
- Co-Founded a non-profit platform to connect and empower Singapore-adjacent students and young professionals across the US.
- Directing relations and events between UCLA, USC, UChi, and NU Singapore Student Associations and reaching out to more schools.
- Aided securing sponsorship and partnerships with Singapore government like Singapore Global Network and NUS-Enterprise.

Kappa Theta Pi (KTP) – Co-ed Pre-Professional Technology Fraternity (www.ktpnu.com/) *Nov 2022 – Nov 2023*
VP of Programming, Founding Executive Member
- Planned and organized KTP's 20+ events throughout each quarter, such as Resume, Networking, and Technical Interview Workshops.
- Coordinated 40+ members and exec team to start and maintain concurrent initiatives such as Capstone Projects and Big-Little.
- Managed week-long interview process for 80+ applicants, coordinating coffee chats, group interviews, member deliberations and more.