

WON KO

woko@ucsc.edu, www.linkedin.com/in/won-ko

EDUCATION

University of California, Santa Cruz
Master of Science in Computer Engineering
Emphasise in Robotics and Control
MS, "Autonomously Driving Tricycle with Monocular Vision"
Advisor: Prof. Dejan Milutinović

August 2022

University of California, Santa Cruz
Bachelor of Science in Computer Engineering
Concentration on Robotics and Control

December 2019

TEACHING EXPERIENCE

Teaching Assistant / University of California, Santa Cruz
Mechatronics (ECE 118)

Spring 2022, Fall 2021
Santa Cruz, CA

- Mixed undergraduate/graduate course on intelligent electro-mechanical systems integrating computer, electrical, mechanical, and software engineering.
- Led instructional lab sections teaching students about event-driven programming, hierarchical state machines, sensor design, system integration and graded all the materials with the TA team.
- Maintained and repaired manufacturing-class lab hardware to ensure continuous operation; performed safety checks and managed spare parts to minimize downtime.

Teaching Assistant / University of California, Santa Cruz
Computer Architecture (CSE 120)

Spring 2021, Winter 2022
Santa Cruz, CA

- Undergraduate Level Introduction to Computer Architecture covering examples of current approaches and the effects of technology, performance, instruction set architecture (ISA), pipelining, caches, memory hierarchy, and software/hardware interactions.
- Led instructional lab sections teaching students about RISC-V ISA by using the Hardware description language (HDL) such as the Verilog, SystemVerilog and graded all the materials with the TA team.
- Held weekly office hours to support HDL debugging, simulation, and performance analysis for lab assignments.

RESEARCH EXPERIENCE

Senior Researcher / Future Tech R&D Lab, Mobyus

November 2024 - Present

- Led research and development of 3D SLAM and Navigation algorithms for autonomous mobile robots (AMRs) and forklifts (AFLs), focusing on robust localization, perception, and motion planning in complex industrial environments.
- Designed and implemented Guidance, Navigation, and Control (GNC) systems to enable precise maneuvering, obstacle avoidance, and safe human-robot interaction.
- Developed and deployed advanced motion planning frameworks for warehouse automation tasks, including pallet handling, aisle navigation, and autonomous docking.
- Bridged fundamental research and real-world deployment by integrating cutting-edge algorithms into industrial robotic platforms, advancing autonomous logistics and mobility technologies

Researcher / Robotics and Control Lab, University of California

September 2020 - August 2023

- Researched stochastic nonlinear control and feedback and control systems, embedded systems, sensor fusion, guidance, navigation, and control system identification(GNC), especially GPS-free navigation.

INDUSTRY EXPERIENCE**Senior Researcher / Future Tech Team, Mobyus**

November 2024 - Present

- Developed and productionized ROS 2 navigation and SLAM stacks for AFL/AMR platforms; hardened for field reliability with startup checks, recovery behaviors, and fail-safes (E-stop, watchdogs).
- Integrated autonomy with PLC workflows (docking/pallet handling) and site-specific configs; exposed planner/SLAM services, health monitoring, and telemetry for operations.
- Owned builds and releases (colcon, containers, CI/CD) and standardized launch YAML profiles; supported multi-site deployments and incident triage.

PROJECTS**Autonomous ForkLifts (AFL)**

November 2024 - October 2025

- Developed Frenet-frame optimal-trajectory planning with B-spline smoothing for obstacle avoidance and precise docking; implemented a three-wheeled controller on AFL (SD-type motors).
- Built a local SLAM mapping + localization pipeline integrating LiDAR/IMU with ESKF; tuned for stable pose and reliable warehouse navigation; added PLC-triggered behaviors for production workflows.

Continental Intelligent Intersection - *co-sponsored Continental AG*

September 2018 - June 2019

- Researched and programmed a machine learning algorithm (CNN, RNN, SVM, Hidden Markov Model).
- Modified YOLOv3 algorithms to create customized object detection algorithms using C
- Created a module for training the data set from the given sensor data (short/long-range radar, camera).
- Applied the training data set to detect critical scenarios using Python with OpenCV at the intersection, such as pedestrians crossing the intersection and vehicles making left turns.

Autonomous Robot

April 2019 - June 2019

- Built a small autonomous robot using uno32, servos, DC motors, and sensors that can effectively and robustly navigate a standardized field, locate and advance through the field by hiding behind obstacles for a limited time, and then shoot their opponent with a ping pong ball ammo.
- Designed a spring base shooting mechanism, developing a test harness for all the electrical components.
- Constructed and programmed hierarchical state machine (HSM) using Embedded C.
- Calibrated a sensor (tape sensor, beacon detector, track wire) and tested the robot for stabilization.