Yuchen Song

Personal Website: https://yuchen-song.github.io/

Mobile: +1 (858)-220-6445
E-mail: song_yuchen123@163.com

EDUCATION

University of California, San Diego (UCSD), San Diego, United States

Master of Science   **Sept. 2023 - Jun. 2025 (Expected)**

➢ **Major**: Electrical and Computer Engineering (Intelligent Systems, Robotics & Control track) ⏐ GPA: 4.0/4.0

➢ Coursework includes: *Introduction to Robotics, Sensing and Estimation in Robotics, Stochastic Processes in Dynamic Systems, Machine Learning for Robotics, Planning and Learning in Robotics*.

South China University of Technology (SCUT), Guangzhou, China

Bachelor of Engineering & Bachelor of Economics   **Sept. 2018 - Jun. 2023**

➢ **Major**: Robotics Engineering ⏐ GPA: 90.30/100 or 3.83/4.0 ⏐ **Minor**: Finance ⏐ GPA: 85.17/100

➢ Coursework includes: *Classical/Modern Control Theory, Machine Vision and Sensing System, Circuits, Embedded System and Design, Theory and Technology of Robotics, Design and Manufacturing, Industrial Robots and Applications.*

University of California, Berkeley, Online

Summer Session Visitor   **Jun. 2020 - Aug. 2020**

➢ Department: EECS ⏐ Course: *CS61BL Data Structures and Programming Methodology*

COURSE PROJECTS

Robotic System Design with Robot Operating System (ROS)   **Sept. 2023 - Dec. 2023**

Project purpose: Implement points following, localization, SLAM, and path planning on the Qualcomm Mbot Mega RB5 platform.

➢ Modeled the robot car using a bicycle model, employing PID control to drive the robot to the desired waypoints;

➢ Conducted calibration of the onboard camera, utilized Apriltag detection method for landmark identification, and performed coordinate transformations with TF module in ROS to achieve robot localization;

➢ Defined a trajectory for the robot car, leveraging Kalman Filter to do Simultaneous Localization and Mapping;

➢ Applied A* and RRT planner algorithms to build a roomba-like robot capable of path planning.

Design & Manufacturing of Robot Cars (Four semesters' projects) [link]

Group Leader   **Jun. 2021 & Dec. 2021 & Jun. 2022 & Jan. 2020**

*Project purpose: Design robot cars with **Arduino** or **STM32** as the main control board to accomplish the assigned tasks.*

➢ Took charge of the processes: pre-planning, budget managing, robot car designing, mid-term manufacturing, prototype testing, and debugging. Also assigned these tasks to each teammate respectively as the group leader.

<u>Achievement:</u> Designed four versions of cars and successfully accomplished the goals: **the first one** could achieve line tracking and cargo delivering; **the second one** could be controlled via Bluetooth and shoot balls to a specific area; **the third car** was able to conduct wireless charging and electricity storage during the cruise; and **the fourth car** was designed comprehensively to implement obstacles avoidance, line tracking, object detection, grasping and unloading.

RESEARCH PROJECTS

Generalizable Feature Fields for Robot Mobile Manipulation

Advisor: Professor Xiaolong Wang, UCSD   **Sept. 2023 - Dec. 2023**

Research purpose: Learning a generalizable feature fields for world representation based on Neural Randiance Fields (NeRF).

➢ Augment the NeRF model with additional semantic information extracted by CLIP/Dino models.

➢ Executed experiments within Gazebo and Habitat simulators, demonstrating that the incorporation of generalizable feature fields significantly enhanced the success rates of navigating and finding the goal by approximately 8%.

➢ Conduct experiment on Unitree B1 platform in different scenes, with overall success rate over 72.3%.

SKILLS

➢ Coding: Python, Java, C++/C, MATLAB, and R.

➢ Tools: Git, Robot Operating System (ROS), Simulink, and Solidworks.