

Shilong Dai

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Education

University of California, San Diego — Jacobs School of Engineering, San Diego, CA

MS of Electrical & Computer Engineering

Sep. 2019 – Jul. 2021 (expected)

GPA: N/A

Nankai University — Institute of Computer and Control Engineering, Tianjin, China

BS of Control Engineering

Sep. 2015 – Jul. 2019

GPA: 87.15/100.00

Bio

Shilong Dai is interested in the surgical robots (inspired by his surgeon father), and reinforcement learning based robot planning. During his undergraduate, as a team leader, he conducted the robot based wireless signal localization project, which won the second prize of Huawei Cup intelligent contest. Then he wrote a paper about the efficient planning of the robot in the system. In his graduation project, he proposed a hierarchical control structure that combines reinforcement learning with classical planning algorithms.

Research Projects

Autonomous Fingerprinting for Indoor Localization

Guide: [Dr. Liang He, University of Colorado Denver](#)

Sep. 2018 – Aug. 2019

- Reduce the energy consumed by the robot fingerprint collector through map segmentation and efficient motion planning.
- Recover the lost WiFi signal via the proposed dual-band signal difference model.
- Detect the inaccurate WiFi signal with the hypothetical test, and recover them via the short-term signal sequence model.

A Reinforcement Learning Based Multiple Strategies Framework for Tracking a Moving Target

Guide: [Dr. Xuebo Zhang, Institute of Robotics, Nankai University](#)

Jan. 2019 – May. 2019

- Propose a hierarchical control framework to solve robot tracking problem, which consists of a high neural network layer and a low classical control layer.
- Choose Dynamic Window Approach and Potential Field Approach as path planning methods through comparing their advantages and disadvantages, and implement them by Python.
- Establish a robot pursuit evasion environment via OpenAI gym, and train the agent by Proximal Policy Optimization algorithm.

Autonomous Robots Based Indoor WiFi Localization System

Guide: [Dr. Xuebo Zhang, Institute of Robotics, Nankai University](#)

Feb. 2017 – Jun. 2018

- Design the Android map app, which can localize and navigate users indoor.
 - Localized users with WiFi signal and inertial sensors in the smart phone, which are fused by a particle filter.
 - Estimate the uncertainty of WiFi signal via the Gaussian stochastic process.
 - Constructed the robot WiFi collection platform, which can perform SLAM and autonomously survey the indoor space to collect WiFi signal samples.
 - Designed the remote server which manages the fingerprint map database and updates fingerprints in the client side.
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Course Projects

Modeling and Controlling of Three-Wheel Forklift Truck

May. 2018 – Jun. 2018

- Establish the mathematical kinematic/inverse kinematics model of a forklift truck with two fixed wheels and one steering wheel and simulated it in Matlab.
- Used a linear controller with dead-zone to control the forklift truck to reach any arbitrary pose.

Face Detection and Recognition

Oct. 2017 – Jan. 2018

- Extract Haar-like features of faces, and using AdaBoost algorithm to compose these feature to detect faces.
- Recognize faces of classmates via a Convolutional Neural Network.

Controller of 3 DoF Helicopter

Nov. 2017 – Dec. 2017

- Design the servo controller, including a velocity loop and a position loop.
 - Adjusting parameters of PID with pole-placement theory.
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Publications

[Autonomous WiFi Fingerprinting for Indoor Localization](#)

arXiv preprint arXiv:1911.11825, 2019

Shilong Dai, Liang He, Xuebo Zhang

Awards

Gongneng Scholarship, Nankai University

Mar. 2016 – Mar. 2019

The 2nd Prize, the 8th Huawei Cup National Undergraduate Intelligent Design Contest

Aug. 2018

Skills & Others

Machine Learning: Statistical Learning, Bayes Network, Gaussian Stochastic Process, Neural Network, and Reinforcement Learning.

Robotics: Robot Kinematics, Linear Control Theory, Path Planning, Kalman Filter, Particle Filter, SLAM.

Programing: Excellent in Python, and Java. Proficient in C++, Javascript, Lua, and ROS.

Interests: Open Source Software, Blog, Game Design