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: 87.30/100.00

Research Projects

Autonomous Fingerprinting for Indoor Localization
Guide: Dr. Liang He, University of Colorado Denverk   *Sep. 2018 – Aug. 2019*
  ◦ Reduce the energy consumed by the robot fingerprint collector through map segmentation and efficient motion planning.
  ◦ Recovery 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.

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 PIDs with pole-placement theory.

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 Development