Li Zhoujian

|Gender:Male Age:23| Phone: +86 15371992870
|Email:zhoujianli01@u.nus.edu|

Education

Soochow University(Project 211) 2020.9-2024.09
Bachelor of Intelligent Manufacturing Engineering
GPA: 3.5/4.0 Weighted Average Mark: 86/100
Relevant Courses:
Modeling and Simulation of Industrial Robots (95/100), Advanced Mathematics I-2(94/100), Robotics(93/100), Industrial Internet(93/100), Java Programming(90/100), Intelligent Manufacturing Information System(90/100), Intelligent Sensing(90/100), Linear Algebra (89/100), Artificial Intelligence(88/100), PLC & Electric Control(87/100) etc.
Scholarships:
2020-2021 Second-Class Academic Excellence Award(13%)
2021-2022 First-Class Innovation and Entrepreneurship Scholarship(2%)
2022-2023 Second-Class Academic Excellence Award (13%)**&** First-Class Innovation and Entrepreneurship Scholarship(2%)

Academic Projects

Competitions:

●National First Prize in RAICOM (RoboCom Robotics Developer Competition) National Finals Aug. 2023
●National Second Prize in the 24th China Robotics and Artificial Intelligence Competition Aug. 2022
●National Third Prize in the 16th China College Students Computer Design Competition July 2023
●Provincial First Prize in the 13th Jiangsu Province College Students Robotics Competition Nov. 2022
●Provincial Second Prize in RAICOM (RoboCom Robotics Developer Competition) Jiangsu Regional Contest July. 2023
●Second Prize in the 16th Siemens Cup 'Intelligent Manufacturing Challenge' National Preliminary Aug.2022
●Provincial Third Prize in the 10th National College Students Optoelectronics Design Competition Aug.2022

Scientific research:

●Autonomous Mapping and Navigation of Intelligent Vehicles Sep. 2020 to Sep. 2023
Project partners: Ecovacs University-Enterprise Joint Project
project details:
1. Utilizing convolutional neural networks for pedestrian detection and tracking in videos;
2. Predicting pedestrian trajectories to enable real-time obstacle avoidance for a small car.;
3. Under the YOLOv4 environment, it allows for quick mapping;
4. Autonomous path planning under the ROS (Robot Operating System) framework;

Achievements：
Gather complex environmental information, complete autonomous mapping, plan the best path with the A* algorithm, and the system will also use OpenCV to preliminarily recognize pedestrian postures.
●Offline Reinforcement Learning Strategy for Floor Cleaning Robots Based on Conservative Q-Learning Algorithm Sep. 2022 to Feb. 2023
project details:

1. Within the ROS environment based on the Noetic version, an offline reinforcement learning algorithm CQL (Conservative Q-Learning) is utilized, introducing conservative constraints into the Q-value updates.
2. Various domestic simulation environments are constructed in Gazebo, and path trajectories are generated using the A* algorithm to collect trajectory data.
3. The Rviz tool is employed to view and analyze the robot's trajectory, with manual annotation of the optimal path.
4. The annotated data serves as a supervisory signal to train the model, with the parameters being saved.

Achievements：

A simulation path training set for the vacuum cleaner in Gazebo has been obtained. The conservative coefficient α has been adjusted to optimize the CQL (Conservative Q-Learning) model.

●Ultrasonic Sensor Data Acquisition and Gaussian Modeling for Transparent and Reflective Object Recognition in ROS May. 2023 to Aug. 2023

project details:

1. Implement URDF-based sensor emulation in Gazebo to match real-world sensor physics.
2. Fine-tune Gazebo object properties for high reflectivity and transparency to evaluate sensor performance.
3. Streamline ROS data collection from ultrasonic sensors, construct Gaussian models, and estimate parameters via Maximum Likelihood Estimation..
4. Calculate the accuracy, recall, and F1 score of recognition, and optimize model parameters.

Achievements：

Achieved precise acquisition of ultrasonic sensor data and improved the recognition accuracy of highly reflective and highly transparent objects through the Gaussian model.

Papers:

●Graduation Thesis:

Title: "Research on the Structure and Performance of Copper-Graphene Piezoresistive Sensing Structures by Laser Direct Writing".

●The paper that has been accepted to the top Chinese control conference, CCDC:

Title: "A Reinforcement Learning-Based Algorithm for Rapid Path Replanning of Robot Navigation in Indoor Uncertain Discrete Environments".

●The paper that has been completed :

Title :"TG-RRT*: Enhanced Learning-Based Optimal Path Planning via Transformer-CNN Hybrid Network and Goal-Directed Strategy".

Internship Experience

●Shenzhen Tianchen Defense Communication Technology Corporation

Location: Shenzhen, China Jun.1st.2022 to Aug.31st. 2022

Responsible for assisting in the design of interfaces using the C programming language, and utilizing the common image processing library OpenCV for image training.

●Suzhou Suxiang Robot Intelligent Equipment Corporation

Location: Suzhou, China Jun.1st.2023 to Aug. 31st.2023

Simulation Map Modeling in Ubuntu System and Local Path Planning via Gradient Descent Optimization of the A* Algorithm.

Additional information

Languages: Native chinese, Proficient English

Skills: Proficient in C/C++, Python, PyTorch, Ros, Matlab/Simulink, Origin, Ubuntu system etc.

Interests: Software programming, Artificial intelligence, Robotics, Volunteering, Investment.

School experience: Software Engineering Club Event Coordinator, Leader of the Intelligent Manufacturing Class.