Runhan Zhang

zhangrunhan@whu.edu.cn
18895324431
https://github.com/Runhane

Education

Sep. 2021 – Jun. 2025 **Bachelor's Degree Wuhan University** Electronic Information Engineering
GPA: 3.94/4.00 **Rank**: 2/132
Majors: *Advanced Mathematics* (95/100), *Algorithms and Data Structures*(96/100), *Programming Fundamentals*(97/100), *Communication Electronic Circuit*(97/100), *Principles and Interface Technique of Microcomputer*(94/100), *Digital Signal Processing*(91/100), *Engineering Stochastic Mathematics*(92/100).

Jan. 2022 – Feb. 2022 **Intensive Programme University of Cambridge** Machine Learning
Teacher: Dr. Carl Henrik Ek
Grade: A
Contents: Statistical Learning, Probability Theory, Stochastic Process.

Competition

National Undergraduate Electronics Design Contest

- **Description:** Designed a motion target control and automatic tracking system based on Jetson Nano. The core modules of the system include PID control of the gimbal and image processing of the camera.
- **My work:** Apply perspective transformation to get the correspondence between the pixel world and the real world. Use algorithms of color recognition, and rectangular box recognition
- **Result:** The system can control the gimbals to move steadily on the planned path by the information recognized by the camera. By configuring a laser pointer at the end of the two heads, the system can realize the effect of one head tracking the other, and the tracking distance error is within 2cm.

Mathematical Contest in Modeling

- **Description:** Built models including submersible localization and search strategy.
- **My work:** Apply the Extended Kalman Filter (EKF) algorithm to fuse data from multiple sensors to realize localization. Abstract the search and rescue problem into a dynamic map. The map utilizes the probability of Bayes theorem grid based on Markov process. The search path is planned using the A* algorithm and the heuristic function is defined as the probability of the grid around the rescue vessel.
- **Result:** The error in state estimation results is reduced by 37.9% using the EKF algorithm of multiple sensors compared to a single sensor. The difference between the path length planned by the probabilistic map-based A* algorithm and the actual shortest path is 17.4%.

Research

Intelligent Grasping Robot Advisor: Dr. Cien Fan 2022 – 2023

- **Description:** Propose a grasp method for existing 3D vision-based robot grasping that can realize intelligent grasping without retraining for novel instances in which there are uniform categories in the scene.
- **My work:** Introduce an object-centric and class-level representation that scales independently in three dimensions to generalize to novel instances of size or shape variation in the scene. Implement 3D U-Net network combined with the Mean Shift algorithm to cluster and segment the dense point cloud.

- **Result:** Stable category-level crawling was accomplished, with a success rate of 88.6% in the simulation environment and 71.1% in the real world.

Adversarial Attack and Detection Advisor: Prof. Hao Jiang 2023 – 2024

- **Description:** Propose a detection method that can distinguish the adversarial intensity in a fine-grained manner so that subsequent tasks can perform different defense processing against perturbations of various intensities.
- **My work:** The spectra of all the samples in the dataset are computed by discrete Fourier transform to analyze the high frequency components of the image.
- **Result:** In order to accomplish fine-grained detection of adversarial intensities, a 16-layer network is constructed based on the residual block structure. The classification accuracy of the method is greater than 96% for all adversarial samples of different strengths.

Management

Monitor of 2021 Excellent Engineer Class 1

- Recognized as an advanced class.
- Organize activities such as class meetings, company visits and meetings with outstanding seniors.

Assistant Class Teacher of 2022 Excellent Engineer Class

- Assist class teacher in class management.
- Serve as a course teaching assistant, answer questions and provide academic support to students.

Skills

Languages	Strong reading, writing and speaking competencies for English, Chinese. **CET**-4: 604/750 **CET**-6: 528/750
Software	Object Oriented Programming, Data Structures, Programming in Python, Advanced C Programming.
Hardware	Microcontroller Interfacing, Electronic Circuit Analysis & Design.
Programming	**Experienced**: C, Python, C++, Verilog.
	Familiar: Bash, HTML/JavaScript.
Tools/Applications	Visual Studio, MATLAB, Anaconda, Docker.
Operating Systems	Windows, Linux.

Awards and Achievements

2021-2023	**Excellent Student Leader**, Wuhan University.
	Merit Student, Wuhan University.
	The First Prize Scholarship, Wuhan University.
	Enterprise Scholarship, Wuhan University.
2023	**First Prize**, National Undergraduate Electronics Design Contest Committee in Hubei Province.
	First Prize of Dance Competition, Wuhan University.
	Third Prize of Choral Competition, Wuhan University.
	Advanced Class, Wuhan University.