Runhan Zhang

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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

- 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.
- This system obtains the correspondence between the pixel world and the real world through the perspective transformation of the image, and gets the real-time attitude of the gimbal by combining the mapping relationship between the spherical coordinate system and the planar coordinate system, and ultimately realizes the precise motion target control.
- Fast automatic tracking is realized by color recognition and PID control.

Mathematical Contest in Modeling

- Proposed models including submersible localization and search strategy.
- Applied Extended Kalman Filter to estimate and update the submersible's state. The observation equipment includes an Inertial measurement unit and forward-looking sonar.
- Abstracted search process into a dynamic map. This map constantly updates the probabilities of each grid using a Markov process based on Bayes' theorem. Used A* algorithm to plan the search path with defining the heuristic function as the probability of grids surrounding the current rescue vessel.

Research

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

- Implement an intelligent grasping approach based on category-level priors.
- 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.
- Use the 3D U-Net network combined with the Mean Shift algorithm to cluster and segment the dense scene point cloud to obtain the target instance point cloud.

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

- 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.
- Amplify the high-frequency component of the image and input it into the deep neural network based on the residual block structure to classify adversarial intensities at a fine-grained level.
- This proposed method not only has advanced performance in Auto Attack detection by perturbation intensity classification, but also can effectively apply to detect examples of unseen adversarial attack methods.

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, Software Engineering Tools Lab, 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.