

Yimin Zhao

✉ztony0712@outlook.com — 🌐https://ztony0712.github.io/ — 🏠Kunming, China

PERSONAL SUMMARY

Interested in applying AI in various interdisciplinary fields, especially in biomedical information analysis and autonomous vehicles. Strong project experience in simulation, programming, and EEG analytics. Conducting research in Autonomous School Bus Group supervised by Prof. Marcelo H. Ang Jr. in Advanced Robotics Centre of National University of Singapore. Looking for fully funded PhD positions.

Strength: Have strong execution and sense of responsibility, passionate to explore and learn.

EDUCATION

National University of Singapore, Singapore

Aug. 2023 — Present

Master of Science in Robotics

GPA: 4.17/5.0

Supervisor: Prof. Marcelo H. Ang Jr.

Representative Modules: Robot Vision and AI; Autonomous Mobile Robotics; Materials, Sensors, Actuators and Fabrication Technologies; Robot Kinematics; Robot Dynamics and Control

University of Leeds, Chengdu, China

Sept. 2019 — Jun. 2023

Bachelor of Science in Computer Science (2:1)

Average Score: 72.2/100

Affiliation: SWJTU-Leeds Joint School, Southwest Jiaotong University

Representative Modules: Machine Learning; Algorithms and Data Structures; Artificial Intelligence; Data Mining; Object Oriented Programming; Software Engineering; Web Application Development

PUBLICATIONS

- [1] **Yimin, Zhao** and J. Gu. Feature fusion based on mutual-cross-attention mechanism for eeg emotion recognition. In *Medical Image Computing and Computer Assisted Intervention — MICCAI 2024 (Accepted)*, number arXiv:2406.14014. arXiv, June 2024.
- [2] H. Wang, S. Gao, **Yimin, Zhao**, M. Song, H. Wang, and D. C. Rompapas. The mind commands you: Combining brain-computer interactions with augmented reality to control internet of things (IoT) tools, and robotic platforms. In *2022 IEEE 5th International Conference on Electronics Technology (ICET)*, pages 1026–1031, May 2022.

ACADEMIC EXPERIENCE

Feature Fusion Based on Mutual-Cross-Attention Mechanism for EEG Emotion Recognition

National Natural Science Foundation of China, Singapore

Dec. 2023 — Mar. 2024

- Proposed a purely mathematical MCA which fuse two features more effectively; developed a unique Channel-Frequency-Time 3D feature structure, which presents spectral and temporal information simultaneously.
- Published to *Medical Image Computing and Computer Assisted Intervention – MICCAI 2024*.

Motion Planning Simulation for Autonomous Driving

Master Thesis: Final Project Report, Singapore

Oct. 2023 — Apr. 2024

- Simulated and visualized four advanced planners using the unified dataset and simulator provided by nuplan-devkit; created an evaluation score benchmark for comparison and analysis.
- Designed a novel learning-based planner based on diffusion model; simulated and evaluated the new planner for comparing with the benchmark.

Emotion Judgment System Based on Deep Learning and EEG Analysis

National Student Research Training Program, China

May. 2021 — May. 2022

- Pre-processed DEAP dataset through band-pass filter and Independent Component Analysis (ICA) by using Python MNE package library.
- Extracted wavelet coefficients using the db4 wavelet of the continuous wavelet decomposition; generate 'scale' (64) dimension from frequency (128 Hz) dimension (Nyquist rate); calculated average energy to Shannon entropy ratio (EER) for each scale; selected appropriate ranges of scale to calculate.
- Built a novel four-classifier by merging bi-classifier; experimented and filtered the eight dominate channels with the most prominent emotional response to enhance model performance.

Design and fabrication of a brain-controlled rolling robot based on OpenBCI-Python-Arduino

Provincial Student Research Training Program, China

Jun. 2020 — May. 2021

- Designed and programmed a simple 'admissible heuristic' by utilizing RNN in TensorFlow.
- Pre-processed EEG data using NeuroPype to remove noise; extracted feature through the Common Spatial Pattern (CSP); employed Linear Discriminant Analysis (LDA) as classifier.
- Designed and developed a novel 'Disk' human-computer interaction interface by PyQt of Python. The output of the classifier indirectly controlled the robot by switching 'gears' on the 'Disk' that represent different motion states.
- Published to International Conference on Electronics Technology (ICET), 2022.

WORK EXPERIENCES

Xi'an ZhenTec Co., Ltd

Software Engineer, Technical Department

Jul. 2021 — Sept. 2021

- *EEG-based emotion classification*: Created video experimental paradigm; built a experimental platform utilizing marking box, EEG collector, amplifier, and paradigm; programmed data collection script.
- *EEG-based sleep stages monitor*: Implemented OSC port listening to achieve the overall data transmission; developed sleep stages display interface using PyQt.

EXTRACURRICULAR EXPERIENCES

School of Mechanical Engineering

President, Model Aircraft Association

Sept. 2020 — Jun. 2022

- *Competition organization*: Planned and organised 12th and 13th Mechanics Innovation Competitions; responsible for the topics review, material and site preparation, publicity, and result review.
- *Vertical take-off and landing (VTOL) project*: Initiated the VTOL project sponsored by Leeds Life Foundation; designed structure and completed the deployment of the control devices.
- *Administrative work*: Took charge of the financial management, staff recruitment and documents writing.

HONOUR

- National Second Prize, China-US Young Maker Competition (CUYMC)
- Successful Participant, 2021 Mathematical Contest in Modeling

SKILLS

- **Programming**: Python, C++, MATLAB, C, HTML5, CSS3, JavaScript, Java
- **Libraries**: PyTorch, nuplan-devkit, TensorFlow, Numpy, Flask, Django, PyQt, Qt, OpenCV
- **Software**: L^AT_EX, Git, Linux, Anaconda, ROS Noetic, ROS Humble, Docker, OpenBCI, Eprime
- **Language**: Mandarin (native), English (proficient), Japanese (basic)