YIMIN ZHAO

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Education

National University of Singapore Singapore
Master of Science in Robotics Aug.2023-Present

Southwest Jiaotong University Chengdu, China
Bachelor of Science in Computer Science Sept.2019-June 2023
Accounting-Weighted Average Mark 88.6/100
Representative Courses: Mathematics 100/100; Computer Processors 100/100; Procedural Programming 99/100; Databases 97/100; Machine Learning 96/100; Algorithms and Data Structures I 96/100; Computer Architecture 95/100; Web Application Development 94/100; User Interfaces 94/100; Materials and Waves 92/100;
Honour: Second Prize, China-US Young Maker Competition (CUYMC)
National Third Prize, 17th "Challenge Up"
Provincial First Prize, 16th "Challenge Up"
Successful Participant, 2021 Mathematical Contest in Modelling
Third Prize, 12th Extracurricular Scientific and Technological Innovation Experimental Competition
First Prize, 13th Extracurricular Scientific and Technological Innovation Experimental Competition
Comprehensive Second-Prize Scholarship, Southwest Jiaotong University, 2020-2021
Excellent Student Cadre, Southwest Jiaotong University, 2020-2021

Publications

W. Haohong, G. Shenghao, **Z. Yimin**, S. Maojia, W. Heng 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," *2022 IEEE 5th International Conference on Electronics Technology (ICET)*, 2022, pp. 1026-1031, doi: 10.1109/ICET55676.2022.9824583.

Research Experiences

Neural Mechanism of Multi-modal Emotion Recognition Based on Brain Network Analysis
Sichuan Provincial Natural Science Foundation Youth Project
Team Member *Jan. 2022-Dec. 2023*

- ✓ In charge of using Differential Entropy, Power Spectral Density, kurtosis coefficient and frequency band power to conduct multi-feature fusion process on the Electroencephalogram (EEG) data
- ✓ Utilised and optimized 3D-CNN for better classifying sentiment

Emotion Judgment System Based on Deep Learning and EEG Analysis
National Student Research Training Program
Team Leader *May. 2021-May. 2022*

- ✓ Pre-processed DEAP data set through band-pass filter of the MNE package in Python and independent component analysis (ICA)
- ✓ Extracted wavelet coefficients using the db4 wavelet of the cwt continuous wavelet decomposition; calculated average energy to Shannon entropy ratio (EER) for each scale and selected appropriate ranges of scale to simplify calculation steps
- ✓ Built a new four classifier by integrating two classifiers; filter the eight lead channels with the most prominent emotional response for the simplification of data pre-processing and comparison

Functioning Fungi: A model based on climate and interaction trait
Mathematical Contest in Modelling *Mar. 2021-Apr. 2021*

Student Advisor

- ✓ Collected related material and literature about modelling tools and the topic of this contest; analysed useful information and recommended all helpful materials to team members
- ✓ Supervised the progress of each member and assisted them in debugging some codes and offered suggestions for paper structure; finished conclusion of the paper and collated reference

Design and Manufacture of Brain-controlled Multifunctional Rolling Robot Based on OpenBCI-Python-Arduino

Provincial Student Research Training Program

Team Member *Jun. 2020-May. 2021*

- ✓ Applied TensorFlow to design machine-learning back-end code and decode EEG signals; classified EEG signals into "left" and "right" signals
- ✓ Installed and used NeuroPype to analyse EEG; utilised Wave Filter, Common Spatial Pattern (CSP) and Linear Discriminant Analysis (LDA) to conduct EEG noise removal, feature extraction and final direction classification
- ✓ Designed a new "Disk" human-computer interaction interface and used PyQt of Python to develop it
- ✓ Won the First Prize in the Provincial China-US Young Maker Competition (CUYMC) and Second Prize in the National China-US Young Maker Competition; received a grant from the Google's China Education Partnership Program

Work Experience

Xi'an ZhenTec Co., Ltd **Xi'an, China**

Software Engineer *Jul.2021-Sept.2021*

- ✓ Made video experimental paradigm to collect data and evaluate the final result
- ✓ Took advantage of a marking box, EEG collector, amplifier, a computer for playing the paradigm, and a computer for data collection to build the experimental platform; proposed to use OSC port to solve the overall data transmission problem in the project that used EEG analysis to monitor sleep stages.
- ✓ Utilised PyQt of Python to conduct front-end interface development and debugging of EEG sleep staging project

Extracurricular Experiences

Model Aircraft Association, School of Mechanics and Aerospace Engineering, Southwest Jiaotong University

Director *Sept. 2020-June 2022*

- ✓ Organised and planned 12th and 13th Mechanics Innovation Competitions; responsible for the review of competition topics, material procurement and reimbursement, pre-competition publicity, competition system planning, and competition result review
- ✓ Led a team to design and finish the vertical take-off and landing (VTOL) project and gained 500 pounds of sponsorship from Leeds Life Foundation
- ✓ Took Charge of the financial management, staff recruitment and documents writing work in the Association

Personal Skills

Computer Skills- Development: Python, C++, C, MATLAB, Java, HTML5, CSS3, JavaScript

Writing: Overleaf (LaTeX), Markdown (Readme)

Libraries: PyTorch, TensorFlow, NumPy, PyQt, Flask, Django

Software and Others: Anaconda, Colab, Git, Windows, MacOS, CentOS, Ubuntu, E-Prime, Xshell, ZhenTecBCIServer, OpenBCI, NeuroPype