Zhenghao He

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EDUCATION

Tongji University **Shanghai, China**

Bachelor of Engineering in Computer Science and Technology *Sept 2020 – July 2024(expected)*

GPA: 4.35/5.00, 88.50/100

Core courses: Pattern Recognition, Machine learning, Operating Systems, Data Structures, High-Level Language Programming, Discrete Mathematics, Formal Languages and Automata

PUBLICATIONS

- **Zhenghao He**, Ruifan Chen, Yayue Hou, Fei Xie, Xiaoliang Gong, and Anthony G. Cohn. "A Music Labeling Model Based on Traditional Chinese Music Characteristics for Emotional Regulation." *In Proceedings of the 2023 12th International Conference on Software and Computer Applications*, pp. 53-58, February 2023.
- Fei Xie, Xiaoliang Gong, **Zhenghao He**, Tongqi Wu, Yan Lu, and Mohan Zhao. "Alzheimer's Disease Early Diagnosis Based on Resting-State Dynamic Functional Connectivity." *In Proceedings of the 2023 12th International Conference on Software and Computer Applications*, pp. 356-361, February 2023.
- Mohan Zhao, Lu Pang, Yan Lu, Fei Xie, **Zhenghao He**, Xiaoliang Gong, and Anthony George Cohn. "Conditional Domain Adaptation Based on Initial Distribution Discrepancy for EEG Emotion Recognition." *CLIP@MICCAI 2022: Clinical Image-Based Procedures,* pp. 72-81, January 2023.
- **Zhenghao He**. "Comparison Of Different Machine Learning Methods Applied To Obesity Classification," *2022 International Conference on Machine Learning and Intelligent Systems Engineering*, pp. 467-472, November 2022.

RESEARCH EXPERIENCES

A Music Labeling Model Based on Traditional Chinese Music Characteristics for Emotional Regulation

Shanghai, China

Advisor: Assoc Prof. Xiaoliang Gong, Tongji University *Apr 2022 – Mar 2023*

- Extracted features for different length fragments of a piece of music, used them to build a classification model for the five modes of traditional Chinese music by utilizing CNN, and achieved an accuracy rate of 71.09%
- Constructed a music mode labeling model based on a weighted combination of the different feature models, evaluated it on 13 pieces of music in different musical styles, and received reasonable results from a music theory perspective
- Expanded music libraries that can be used for mood regulation and music therapy

Alzheimer's Disease Early Diagnosis Based On Resting-state Dynamic Functional Connectivity **Shanghai, China**

Advisor: Assoc Prof. Xiaoliang Gong, Tongji University *Apr 2022 – Mar 2023*

- Utilized the DPABI toolbox on the MATLAB platform to preprocess data in batches through time layer correction, head movement correction, space standardization, and smoothing
- Assisted senior students in feature extraction by drawing the correlation matrix using the time signal, approximate entropy, and Lyapunov exponent separately
- Summarized research results, indicating that brain complexity indicators change accordingly with the Alzheimer's Disease continuing and provided a new idea for early diagnosis of the disease

Conditional Domain Adaption Based on Initial Distribution Discrepancy for EEG Emotion Recognition

Shanghai, China

Advisor: Assoc Prof. Xiaoliang Gong, Tongji University *Feb 2022 – Oct 2022*

- Applied three indicators to calculate the distribution differences between source domains and target domains – Maximum Mean Discrepancy (MMD), Mean Discrepancy of Norm 1 (MD-L1), K-L Divergence (KLD)
- Compared the 'source-target pair' domain adaptation method using all source domains to our improved method, achieving an accuracy improvement of up to 10% and a reduction in computation time of up to 43% on the SEED-III and SEED-IV datasets

Comparison of Different Machine Learning Methods Applied to Obesity Classification **Remote**

Winter Program; Advisor: Prof. Shlomo Ta'Asan, Carnegie Mellon University *Jan 2022 – Apr 2022*

- Employed dimension reduction algorithms e.g. PCA, T-SNE, and Isomap to present the distribution of data for observation and analysis
- Applied Support Vector Machine (SVM) and decision Tree(DT) to predict obesity and compared the result with Artificial Neural Network (ANN), which achieved an accuracy rate of 91%
- Figured out that family history of obesity is the most decisive feature of obesity through Principal Component Analysis (PCA) based on the data set

PROJECTS

BrainBeats - a Portable Brain-Computer Interface Device for Fatigue Detection **Shanghai, China**

Team Leader; Advisor: Assoc Prof. Xiaoliang Gong, Tongji University *Feb 2023 – April 2024*

- Designed and conducted fatigue tests, and organized participants to collect data for the experiment.
- Preprocessed the collected data by applying a bandstop filter, and calculated the power spectrum characteristic values using the Hamming window and Fast Fourier Transform (FFT)
- Utilized SVM and LSTM for prediction and conducted ten-fold cross-validation
- Achieved an accuracy rate of 82.05±4.97% on the most accurate device
- Awarded as the Shanghai Innovation and Entrepreneurship Training Program

INTERNSHIP

Alibaba Cloud **Shanghai, China**

AI Model Optimization Intern *Mar 2024 – present*

- GPU fault prediction algorithm design, GPU abnormal data processing and augmentation
- Research and analysis of AI Agents algorithm

Digital Center, HaaenClean Group **Shanghai, China**

Digital Engineer Intern *Sep 2023 – Dec 2023*

- Apply Isolation Forest to process historical data and identify outlier values to ensure the safety of the detection
- Assist the company in deploying a large language model on-premises for private use

Shanghai Research Institute for Intelligent Autonomous Systems **Shanghai, China**

Research Assistant for Assoc Prof. Zhongpan Zhu, Tongji University *Jun 2022 – Sep 2022*

- Assisted the advisor in preparing PowerPoint slides on the topic of bionic robots.
- Draft a patent under the instruction of the professor – Algorithm of Generating Heat Map for Driver's Attention

HONORS & AWARDS

3rd Prize (School-level), 2023 Excellent Student Scholarship at Tongji University Dec 2023

2nd Prize (National Level), 2022 Embedded System Design Invitational Contest (Intel Cup) *Aug 2022*

Bronze Medal (School-level), China College Students Internet+ Innovation and Entrepreneurship Competition *Aug 2022*

OTHERS

Computer skills: C/C++, Python, Java, Verilog, Assembler, MS Office

Languages: Chinese (Native), English (Advanced)