Tianyu Gao

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Education

Beijing Jiaotong University (BJTU) Beijing, China

Major in Computer Science and Technology 09.2021-07.2025

- **GPA**: 3.64/4.0; **TOEFL**: 91
- **Course**: Group Training of Program Design (96), Object-Oriented Design and C++ Programming (95), Python Programming Training (A), Machine Learning (94), Calculus II (95), Mathematical Modelling Method (A)

Tsinghua University High School Beijing, China

High school student 09.2018-07.2021

- Member of Resource Environment and Geographic Information Advanced Research Laboratory

Academic Experience

Research on the Uncertainty in Multi-modal Emotion Recognition 01.2023-current

Supervisor: Prof. Jing Wang

- Completed the design of multi-modal EEG emotion recognition models, currently in the model optimization and adjustment phase. Reproduced 4 baselines models after conducted a comprehensive review of 20 key papers from top journals and conferences (TAC, ACM MM, AAAI, IJCAI) between 2020 and 2024.
- Studied the uncertain factors affecting multi-modal EEG emotion recognition models and explored the mutual influence between modalities. Designed models to estimate and integrate modality-specific uncertainties, enhance the robustness of existing neural network frameworks and improve emotion recognition accuracy.
- Utilized multi-modal fusion mechanisms to address modality uncertainties. Employed knowledge distillation and missing modal interpolation methods to implement emotion recognition under conditions of missing or perturbed modalities. DEAP and HCI datasets were used for experimental verification.

Impact of interactivity on perceived emotional challenges, emotional experiences, and physiological responses

Supervisor: Xiaolan Peng 05.2024-current

- Completed the statistical analysis of experimental data and written a paper that is currently being revised for submission to the IJHCI journal as a co-first author.
- Explored whether simple narratives in games bring emotional challenges and the impact of enhanced interactivity on players' emotional challenges, emotional experiences, and physiological responses.
- IBM SPSS was used for statistical analysis of the self-reported scale data, Biopac was used to collect physiological signals, and MATLAB was used to analyze the data. Designed experiments with interactivity as the core independent variable, and emotional challenges, emotions, and physiological signals as dependent variables.

Guide APP - Personalized College Entrance Examination Application to Beijing Jiaotong University

College Students' Innovative Entrepreneurial Program 05.2023-05.2024

- Developed a personalized recommendation system for Beijing Jiaotong University majors based on high school graduates' scores, rankings, and interests. The project is currently undergoing software copyright application.
- Provided suggestions on how to choose majors according to personal interests, hobbies, and strengths. The system predicts the success rate of applications, provides detailed information about schools and majors, and provides a forum for experience sharing. It supports both app and web platforms, allowing users to access it conveniently.
- Implemented a score prediction model based on ARIMA. Utilized CRF for word segmentation and part-of-speech tagging, TF-IDF for word frequency calculation, and the LDA model for student interest modeling. The pre-trained model BERT was used for semantic analysis. Developed algorithms using Python, and built frontend web pages with Vue, backend with Spring Boot, and databases with MySQL.

Research on a License Plate Detection and Recognition System Based on YOLOv5 and LPRNet 07. 2023

- Designed a license plate detection and recognition system, which improved the average recognition accuracy from 98.0% to 99.5% on the CCPD dataset. Served as the leader to undertake the whole planning and schedule of the whole project, completed the deployment of LPRNet, conducted model training and parameter adjustment.
- Optimized and integrated YOLOv5 for object detection and LPRNet for license plate recognition, followed by model training and parameter adjustment to realize the system. Developed the program using Python. Completed front-end system support, enabling users to upload images for identification.

Other Projects

- Final Project of Machine Learning 11. 2023-12.2023

  Implemented a feedforward neural network by PyTorch for handwritten digit recognition, achieving 98.06% accuracy on the MNIST dataset, surpassing baselines: random forest and SVM. Conducted performance comparison and visual analysis for model interpretability using Captum.

- Final Project of Software Development 11. 2023-12.2023

  Developed a comprehensive Sudoku game with features like playing, hints, user management, score computation, and ranking. Led the project planning and scheduling as the project leader, developed back-end algorithms, and integrated front-end and back-end. Designed UI with Axure RP and developed the game using Qt and C++.

- Final Project of C++ 12. 2022

  Developed a student information management system for managing student data, including essential CRUD (Create, Read, Update, Delete) operations, searching and sorting functionalities, and secondary details like course enrollment and advisor information. Independently programmed the system with a modular design.

- Final Project of C Language 05. 2022-06. 2022

  Designed a character counting system for files, including Chinese characters, letters, and special characters, with web interface input/output and performance calculation for processing time. Independently developed the system.

Internship Experience

Institute of Software, Chinese Academy of Sciences (ISCAS) Beijing, China

Research Intern in Research Group of Researcher Jin Huang 05.2024-current

- Participated in a project on detecting affective disorders, focusing on the severity of depression. Utilized eye-tracking technology to detect emotional disorders through emotional facial recognition.
- Conducted experiments using VR equipment and eye-tracking devices, tracking eye movements while participants watched a moving ball video. Administered questionnaires to participants for additional data collection.
- Organized and analyzed data to understand the correlation between eye movements and emotional disorder severity, contributing to the development of diagnostic tools for affective disorders.

Leadership and Extracurricular Activities

Student Union, School of Computer Science and Technology

Head of practice department 09.2021-06.2023

- Responsible for practical activities and within the School of Computer Science and Technology. Led a team of 8 members to plan and organize various activities. Planned and executed club recruitment and orientation events, and facilitated department transitions. Organized the 2022 Knowledge Competition for the School of Computer Science and Technology (over 100 participants) and various promotional lectures (over 300 participants in total).

"Winter Olympics for the Future" Summer Social Practiced Group

Team leader 06.2022-09.2022

- Led a team to research and promote the spirit of the Beijing Winter Olympics. Planned and executed field trips, including visits to the National Speed Skating Oval and Yanqing Winter Olympic Village. Organized interviews with Chief Designer Fang Zheng and Chief Engineer Jiulin Li. Established connections with the Chinese ice hockey team operations and coach Runxi Feng. Facilitated dialogue with peers from various countries. Our group received the First Prize in the Beijing Jiaotong University Summer Social Practice Activities.

Awards and Honors

- Third Prize in the Beijing Group of the Undergraduate Group in the National Simulation Innovation Application Competition (China) 2023
- Third Class Scholarship 2022-2023
- Third Prize in Mathematics Competition of BJTU 2022-2023
- First Prize in the Summer Social Practice of BJTU 2022-2023
- Second Prize in the Freshman Programming Competition of BJTU 2021-2022

Others

- **Skills:** C/C++, Python, SQL, MATLAB, Qt, Vue, HTML, Java, Spring Boot, JavaScript
- **Interest:** Badminton, swimming