Yuntian Wu

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Education Background

Huazhong University of Science and Technology 09/2021-07/2025
Major: Artificial Intelligence GPA: 80/100 (GPA of the 6th semester: 85.96/100)
Degree: Bachelor of Engineering

Exchange Program

University of Cambridge 01/2022-02/2022
Project Name: Two-week Cambridge Intensive Programme in Machine Learning
Major Courses: Machine Learning Grade: A
Outcome: Gained a comprehensive understanding of machine learning, tested the performance differences of various regression methods, and utilized a self-built LSTM model for stock prediction

Honors & Awards

- Honor List, Harmful Brain Activity Classification on Kaggle (**491/2767**) 04/2024
- Honor List, LLM Prompt Recovery on Kaggle (**507/2175**) 04/2024

Publication

- Invariant Spatiotemporal Representation Learning for Cross-patient Seizure Classification 10/2024
  - Accepted by NeuroAI @ NeurIPS2024 organized by Yoshua Bengio who won 2018 A. M. Turing Award
  - Link: https://openreview.net/forum?id=Ex6wAivo7G (Accepted Papers (neuroai-workshop.github.io))

Research Projects

- **Research on EEG-based Cross-patient Seizure Classification Task** **Peking University (In Progress)**
  Research Intern for Dr. Haoxuan Li from Peking University 05/2024 - Present
  - Tested and modified the program codes mentioned in an ICLR 2022 paper named *Self-Supervised Graph Neural Networks for Improved Electroencephalographic Seizure Analysis*
  - Reproduced the internal models of "MSTGCN" and "FeatureNet" from the *Multi-View Spatial-Temporal Graph Convolutional Networks with Domain Generalization for Sleep Stage Classification*, an extension work from IJCAI 2020 conference paper, and tested them in comparison baselines
  - Reproduced the inner model of "patient-adversarial neural network (PANN)" in *Cross-Patient Automatic Epileptic Seizure Detection Using Patient-Adversarial Neural Networks with Spatio-Temporal EEG Augmentation* and adapted it to our method
  - Proposed and validated a novel Invariant Representation Learning method on the TUSZ dataset

Innovation: To innovate the model frame on both spatial and temporal scales to enhance its capabilities for cross-patient seizure classification, effectively overcoming the distribution shift between training and test domains.

- **Harmful Brain Activity Classification on Kaggle** **Huazhong University of Science and Technology**
  Team Leader 01/2024-04/2024
  - Analyzed the dataset, examining its data features across both temporal and frequency domains. Carried out further data processing by reference to a journal paper named *A Review of Feature Extraction and Performance Evaluation in Epileptic Seizure Detection Using electroencephalography (EEG)*
  - Reproduced basic models like ChronoNet to test their capabilities
  - Conducted data training with WaveNet, EfficientNet, and a transformer-based model generated by myself

- Came across the paper titled *Self-Supervised Graph Neural Networks for Improved Electroencephalographic Seizure Analysis*

Contribution: Improved model performance on the given EEG dataset by employing an ensemble approach using EfficientNet and WaveNet, while optimizing training precision through a two-stage training method.

➢ **Object Detection and Tracking Benchmark** **Huazhong University of Science and Technology**
Team Member 03/2024-06/2024

- Reproduce the model of TransTrack from the paper *TransTrack: Multiple-Object Tracking with Transformer*
- Utilized YOLOv8 as the detector to adapt trackers like SORT, ByteTrack, and BOT-SORT for performance
- Reproduce Fast R-CNN, and MambaYOLO to extend our benchmark
- Tested the models on a bee detection and tracking dataset and wrote a technical report about their performance

➢ **Deep Learning-based Portrait Addition Program** **Xi'an Jiaotong University**
Research Intern for Associate Professor Bin Shi from Xi'an Jiaotong University 10/2022-07/2023

- Designed the program details and conducted all the experiment operations
- Tested images on the code from the WACV 2020 paper Deep Image Blending
- Detected target portrait with U^2-NET to generate a mask to resolve the failure of the original model
- Reduced the style loss of the original model while keeping content loss to mitigate cross-color caused in the improved model when carrying out portrait fusion
- Designed a square choice box to generate a canvas mask and control the fusion position, settling down the failure of a control area when adding a portrait
- Built a preview website for the program with other team members

➢ **Deep Learning-based Handwritten Numeral Identification Program**
Huazhong University of Science and Technology *Team Leader* 12/2021-03/2022

- Learned knowledge about the WAP series, ABM, and CAN through thesis and papers
- Reproduced the functions of the DWAP model and CAN model
- Designed relevant applications and tested them in real-life

Internship

➢ **LongShine Technology Group Co., Ltd.** **System Development Department** **Beijing**
Intern, System Engineer 07/2023-08/2023

- Understood the operation and structure details of the Jingtong system
- Participated in the operation and maintenance of the Jingtong system, an app popular among local residents while also ensuring its reliable operation during the Beijing 2022 Winter Olympics
- Built, packaged, and deployed the K8S cluster with Linux and participated in the construction of a new cluster and the deployment of applications, while implementing Prometheus for comprehensive cluster monitoring

Extracurricular Activities

➢ **Literature and Art Department of the Student Union** Huazhong University of Science and Technology
Member 09/2021-02/2023

- Worked with college, departments, and different clubs to arrange various shows
- Planned and arranged various activities and joined preparations for the school anniversary activities

Skills & Hobbies

➢ Computer Skills: Python, C/C++, Matlab; Pytorch, Tensorflow, Kubernetes
➢ Outdoor Sports: canoeing, wilderness survival, skiing; Instrument: Guitar, drum set