Wentao Wu

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EDUCATION

University of Pennsylvania, School of Engineering and Applied Science   **Philadelphia, PA, USA**
Master of Science in Engineering: Bioengineering   Expected May. 2025

Southeast University, School of Biological Science and Medical Engineering   **Nanjing, CHN**
Bachelor of Engineering: Biomedical Engineering   June. 2023
Cumulative GPA: 3.52/4.00 | Average Score: 87.43/100

SKILLS

Languages: Chinese (Native), English (Proficient)

Computer: Python, MATLAB, R, C++, Shell, ANTs, FSL, ITK-SNAP, DSI-studio, Mango, Photoshop, LaTeX, LabVIEW, Multisim, Quartus II, OpenSim

PROFESSIONAL EXPERIENCE

Laboratory for Neural MRI and Brain Connectivity @ CHOP and Penn   **Philadelphia, PA, USA**
Student Researcher, Advisor: Dr. Hao Huang, Dr. Minhui Ouyang   Sep. 2023 – Present

Institute of Neuroscience, Chinese Academy of Sciences - Center for Excellence in Brain Science and Intelligence Technology, Chinese Academy of Sciences (Translational Brain Imaging Research Group)   **Shanghai, CHN**
Student Researcher, Advisor: Dr. Cirong Liu   Jul. 2022 – Mar. 2023

International Pediatric Medical Imaging Research Laboratory @ SEU   **Nanjing, CHN**
Student Researcher, Advisor: Dr. Yu Sun   Feb. 2022 – Jun. 2023

PROJECTS

Research on Levodopa responsiveness in patients with Parkinson's disease using resting state fMRI brain network connectivity   **Nanjing, CHN**
Bachelor's Degree Thesis, Advisor: Dr. Yu Sun   Nov. 2022 – Jun. 2023
• Preprocessed fMRI data utilizing DPABI and SPM12 toolbox in MATLAB
• Identified patients' intrinsic connectivity networks and calculated static and dynamic functional network connectivity using GIFT toolbox in MATLAB
• Did statistical analyses between groups (eg. PD-on, PD-off, heathy controls, levodopa weak responders, levodopa strong responders) based on static and dynamic functional network connectivity
• Trained machine learning model to predict treatment efficacy in patients with Parkinson's disease (UPDRS-III-change)
• Did correlation analysis between functional network connectivity properties of patients with Parkinson's disease and their UPDRS-III scores

Atypical functional gradient of cerebellum in autism and its association with genetic profiles   **Shanghai, CHN**
Independent Research, Advisor: Dr. Cirong Liu   Sep. 2022 – Mar. 2023
• Compared the brain MRI data of both autistic patients and healthy controls, and figured out the differences in cerebellar

- Used MATLAB and its toolboxes (eg.SPM12) to process the cerebellum template and fMRI data, compute cerebellar connectome gradients in autistic and healthy individuals and analyze the differences between these two groups via statistical methods in both whole cerebellum level and seven subdivisions of the cerebellum
- Preprocessed AHBA transcriptome dataset, and analyze the association between ASD-related gradient differences and gene expression via partial least squares (PLS) regression analysis and gene enrichment analysis
- Did correlation analysis between ASD-related gradient of autistic patients and their ADOS scores
- Discovered that there are some statistically significant differences in the cerebellar connectome gradients between autistic patients and healthy controls and found the linkage between atypical gradient and gene expression profiles

Application of Advanced Sequences of Magnetic Resonance in the Classification and Segmentation of Brain Tumors in Children as an Aid to Diagnosis   **Nanjing, CHN**
Main Participant (Team of 3), Advisor: Dr. Yu Sun   Feb. 2022 – May. 2022
- Utilized multi-modality MRI technology, brain tumor pathology, signal processing and artificial intelligence technology to create a system for segmentation and classification of pediatric brain tumors based on advanced MRI sequences aiming to assist diagnosis and provide clinicians with intelligent diagnostic services
- Applied PyRadiomics toolkit to extract the imaging histology features of multimodal MRI image datasets, and used machine learning in the scikit-learn toolkit for feature filtering and classification
- Built the U-Net based network for the brain tumor segmentation part, trained new members to use and improve it.
- Developed a user interface through self-studying PySide2 and connect it with the back-end project

Modulation of Neural and Physiological Signals by Soothing Music   **Nanjing, CHN**
Independent Research, Advisor: Dr. Xingran Cui   Apr. 2022 – Jun. 2022
- Collected and analyzed physiological signals in real time during music listening, quantified the neutral tension states, and studied the emotional "deep breathing" process of accumulating and releasing stress states
- Pre-processed EEG signal via EEGLAB toolbox in MATLAB and designed a Butterworth filter in MATLAB to filter the EEG signal to the band of interest and plot the EEG signal
- Analyzed the EEG power density spectra at different music listening statuses and the power share of each band, explored the effect of soothing music on neural and physiological signals, and wrote a paper

Design of Blood Oxygen Saturation Detection System   **Nanjing, CHN**
Group Leader (Team of 2), Advisor: Ir. Lei Huang   Sep. 2021 – Dec. 2021
- Synthesized the knowledge of analog, digital and virtual instruments for the implementation of the function of blood oxygen signal measurement
- Converted blood oxygen signal into voltage signal, pre-processed voltage signal in analog section of the system
- Further processed the voltage signal in digital section of the system, calculated blood oxygen saturation and showed PPG wave in digital section using LabVIEW, and operated the switching output of red and infrared light in LabVIEW
- Created a system to measure the user's blood oxygen saturation and show one's PPG wave in real time

EXTRACURRICULAR ACTIVITY

Student Union - School of Information Science and Engineering (SEU)   **Nanjing, CHN**
Director - Publicity Department   Sep. 2019 – Jun. 2021
- Designed the covers of WeChat articles of the official social media account, drafted posts of activities in the school, and promoted the upcoming activities
- Arranged diverse events and designed posts for Student Union Annual Ball, College Education Support Team recruitment, Orientation Camp, and College Sports Day