Zhou Yubin

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Education

South China University of Technology (SCUT), Guangdong, China 2021 – Present

Undergraduate student in Biomedical Engineering (BME), expected July 2025
GPA: 3.51/4.00
Courses: Molecular Biology (96), Signals and Systems (91), Electric Circuits and Electronics (89), Digital Signal Processing (88), Python Programming (87), Principle and Application of Microcomputer (86), Medical image processing (86), Biochemistry (85)

Experience

SCUT MINI(Medical Information and Neuroimaging) Lab Mar. 2022 – Jan. 2024

Research Assistant Intern
Advised by Prof. Kai Wu. Research on biomedical signal processing, medical artificial intelligence and human brain connectomics in automatic diagnosis of stroke, depression and schizophrenia.

- Assist in recruiting subject, collecting and processing EEG/EMG/fNIRS data.
- Participate in lab's meetings, paper writing and revising. One SCI paper has published *(Second author)*.
- Participate in subject competitions under the guidance of adviser and graduate students.

BrainCo Inc. Jan. 2024 – Present

Algorithm Intern
Advised by Mr. Adis, work at BrainCo Shenzhen office.

- Participate in the early research and development on medical ultrasound device.
- Reproduce the code of focused ultrasound control algorithms such as delayed focusing using jwave, and simulate the focused sound field to validate the algorithm.
- Using Arduino to build a simple focused ultrasound prototype now.

Skills

- Programming Languages: Python > MATLAB
- Platform&Tools: Windows; PyCharm, VS Code, JupyterLab, Git, Arduino, LaTeX
- Frameworks: PyTorch, Pandas, Matplotlib, NumPy, SciPy, OpenCV, MNE

Honors and Awards

Meritorious Winner, Interdisciplinary Contest In Modeling (6%) May. 2022
2^{nd} *prize*, National Biomedical Engineering lnnovation Design Competition for College Students Jul. 2023
2^{nd} *prize*, Hongpingchangqing Fund (2k CNY for 3 team members) Sep. 2023
3^{rd} *prize*, University Scholarship (1.5k CNY) Oct. 2023
3^{rd} *prize*, Zhuoyue Scholarship (10k CNY) Nov. 2023

Publication

Discriminative analysis of schizophrenia patients using an integrated model combining 3D CNN with 2D CNN: A multimodal MR image and connectomics analysis Jan. 2024

Brain Research Bulletin, *Second author*

- Propose a novel method for multi-dimensional mining of fMRI image information using an integrated model, which is proposed for the discriminative analysis of schizophrenia patients. This method uses 2D FC matrices based on gray matter maps and 3D T1 images as the input of the neural network, allowing the

model to simultaneously extract spatial topology information and brain functional connection information. Experiments have shown that our method achieved better performance beyond state-of-the-art methods.

PROJECT

Limbs Motor Function Monitoring System Based on EEG and EMG Detection and Analysis

May. 2022 – Jul. 2022

Course design of Exploration and Design of Biomedical Engineering

- Build an automatic classification system to assess the subject's weight-bearing status based on EEG and EMG. The final score of this course design is 92, 4.0/4.0.

Design of auxiliary diagnosis algorithm for schizophrenia based on feature fusion of EEG and ECG

Apr. 2023 – Jul. 2023

Entry for 8^{th} National Biomedical Engineering Innovation Design Competition for College Students

- Build machine learning models for automatically diagnosing schizophrenia, which utilize brain functional network features, heart rate variability features, heart-brain coupling features, and deep features of EEG and ECG extracted by ResNet. As the team leader, I made major contributions to the methodology, code, experiments, and technical report. This work won the second prize in the finals.

Automatic spine segmentation based on an UNet combining 2D and 3D modules

Dec. 2023

Course design of Medical Image Processing advised by Prof. Kai Wu

- Construct an UNet combining 2D and 3D modules to segment 3D MRI spine images. Balance the extraction of information by extracting 2D features in the encoder-decoder structure of UNet, and 3D inter-slice information in the residual connections in the middle. Experiments have shown that the method proposed in this design can be well adapted to the provided thick-slice scanning spine MRI dataset. The final score of this course design is 98, 4.0/4.0.