Penghui Du

Education

2020/08-2024/06 **Southern University of Science and Technology**, *Undergraduate*.
- Major: Intelligent Medical Engineering (Department of Biomedical Engineering)
- Academic Supervisor: Professor Quanying Liu
- GPA: 3.84 / 4, rank 1 / 22.

2023/02-2023/07 **University of Zurich**, *Regular Visiting Student*.
- Main Subject: Neuroinformatics

Academic Experience

2022/08-Now **Research: Relationship between human vision and computer vision**.
- Supervisor: Professor Quanying Liu, SUSTech
- Overview: In this study, we try to encode functional Magnetic Resonance Imaging (fMRI) signals from neural networks' hidden features by Partial Least Squares Regression (PLS) method. We then analyzed similarity between the human brain and neural network according to the encoding performance in object recognition tasks.
- Achievement: This study is currently ongoing and has yielded some preliminary results.
- Contribution: I am the main person in charge of this research project.

2022 / 08 **2022 Neuromatch Academy Computational Neuroscience Summer School**.
- Overview: In this summer school, I learned basic principles of computational neuroscience such as reinforcement learning, leaky Integrate-and-Fire models, Hodgkin-Huxley models and Bayesian inference with other students in our team. After that, we did a project on RNN and working memory and gave a presentation on our result.

2022 / 07 **2022 CLS-CIBR-IDG Summer School in neuroscience**.
- Overview: In this summer school, researchers from molecular/cellular/systems/cognitive backgrounds gave us various exciting lectures on neuroscience. After that, our team discussed a literature about cognitive neuroscience and gave a presentation on the paper.
- Host Institute: Chinese Institute for Brain Research; Tsinghua University; Peking University;

2022/03-2022/07 **Research: Transfer learning to decode brain states reflecting the relationship between cognitive tasks**.
- Supervisor: Professor Quanying Liu, SUSTech
- Overview: We proposed a transfer learning framework to reflect the relationship between cognitive tasks, and compare the task relations reflected by transfer learning and by the overlaps of brain regions.
- Achievement: Periodical results accepted by HBAI2022, a workshop of IJCAI-ECAI 2022.
- Contribution: Analyzed task-driven fMRI data collected from *Neurosynth* and paper writing. Worked as fourth author in this study.

2022/03-2022/06 **Competition: Automatic parotid and submandibular segmentation in CT images**.
- Overview: We trained a deep learning model to divide critical organs in CT images. We proposed a novel pretraining approach, and achieved 85% accuracy.

- Achievement: Our team won the first prize in 2022 Guangdong Undergraduate Biomedical Engineering Innovation Design Competition (9 out of 189 teams).
- Contribution: Team leader. Responsible for model building and report writing.

2021/11-2022/05 **Competition: Business plan for making brain health monitor devices**.
- Overview: We designed a business plan for manufactoring brain health monitor devices for severely ill newborns.
- Achievement: First prize in 13th "Challenge Cup" Entrepreneurship Plan Competition.
- Contribution: Team leader. Responsible for technical ideas and business plan.

Course Projects

2021 / 12 **Designed an OFDM signal transmission simulation system**.
- Achievement: Team leader. Got full marks and was selected as a showcase project.

2021 / 12 **Designed a speech signal synthesis system**.
- Achievement: Team leader. Got full marks for outstanding performance.

2021 / 12 **Designed an n-body gravity-collision simulation system**.
- Achievement: Team leader. Got 95 out of 100 and was selected as a showcase project.

2020 / 12 **Designed an aeroplane chess game independently**.
- Achievement: Got full marks for outstanding performance.

Extracurricular Experience

2021/06-2022/06 **College student tutor**, Shuren college, SUSTech.

2021/02-2022/06 **Teaching assistant for computer programming course**, SUSTech.

2020/08-2021/06 **Member of Volunteer Federation**, SUSTech.

Awards

2022 / 07 2022 CLS-CIBR-IDG – **Merit student of Summer School in Neuroscience**

2022 / 06 2022 Guangdong Biomedical Engineering Innovation Design Competition – **First prize**

2022 / 05 13th "Challenge Cup" Guangdong Entrepreneurship Plan Competition – **First Prize**

2021 / 09 Contemporary Undergraduate Mathematical Contest in Modeling – **wining prize**

2019 / 11 Certified Software Professional-Senior(CSP-S) – **First Prize**

2019 / 07 China National Olympaid in Informatics(NOI) – **Provincial Team Participation**

2019 / 05 The 13th Asia and Pacific Informatics Olympaid(APIO) – **Bronze Medal**

2018 / 11 National Olympaid in Informatics(NOIP) – **First Prize**

Language Ability

English: TOEFL score 105, 18 academic courses taken in English so far.

Computer Skills

Programming languages: JAVA, python, Matlab, C/C++
Operating Systems: Linux
Others: Latex, git

Research Interests

My passion lies at the intersection of computational neuroscience, machine learning, and biological perception. I am eager to pursue a PhD in this field and conduct cutting-edge research in the future. For mor infomation, you can visit my personal website: https://penghui-du.com/