Jiazhen Hong

Piscataway, NJ 08854
Tel: 201-985-4402
Website: https://h128jj.github.io/jiazhenhong/
E-mail: jh1590@rutgers.edu
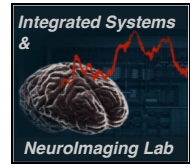
EDUCATION

Rutgers University, New Brunswick, NJ, USA   *Ph.D. candidate* *01/2020 – Present*
Computer Engineering, G.P.A.: 3.9/4.0
Thesis Topic: Artificial Intelligence for Time-Series Signal Processing in Brain-Computer Interfaces (BCIs)

Stevens Institute of Technology, Hoboken, NJ, USA   *M.Sc.* *09/2017 – 01/2019*
Electrical Engineering, G.P.A.: 3.9/4.0

Jimei & Chung Yuan Christian University, China   *B.Sc. (Double Degree)* *09/2012 – 06/2016*
Communication Engineering, G.P.A.: 3.5/4.0

WORKING EXPERIENCE

Integrated Systems & Neuroimaging Lab, Rutgers University   *Teaching/Research Assistant* *01/2020 – Present*
- Developed ChatBCI, a mind-controlled speller system for BCI integrating **LLMs**.
- Designed a **Transformer**-based model to enhance character recognition rates in the P300 speller system.
- Developed topographic image representation for video-like electroencephalography (EEG) signals using **TimeSformer**.
- Created a channel selection method to improve the speed and efficiency of BCI systems for motor imagery tasks.
- Developed a geometric approach to optimize the k-means algorithm, addressing issues with local minima.

EMOTIV, San Francisco, CA, USA   *Research Intern* *10/2024 – Present*
- Developed a **foundation model** for processing time-series signals in brain-computer interfaces.

Conference Reviewer
- International Conference on Artificial Intelligence and Statistics (AISTATS) *2023 – 2024*
- IEEE International Symposium on Biomedical Imaging (ISBI) *2024*

TECHNICAL SKILLS

- Python (PyTorch, TensorFlow, scikit-learn, Qt5, NumPy, Pandas)
- MATLAB® (EEGLAB, Digital Signal Processing toolbox, object-oriented programming)
- Hardware (Brain Products, actiCAP, Raspberry Pi, Arduino, VEX-brain)

PUBLICATIONS

(Accepted/Published)
- **J. Hong**, F. Shamsi, and L. Najafizadeh, "A **Deep Learning** Framework Based on Dynamic Channel Selection for Early Classification of Left and Right Hand Motor Imagery Tasks," Proc. of 44th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC'22), Glasgow, Scotland, July 2022, pp. 3550-3553
- **J. Hong**, L. Najafizadeh, "P3T: A **Transformer** Model for Enhancing Character Recognition Rates in P300 Speller Systems," 58th Annual Asilomar Conference on Signals, Systems, and Computers
- **J. Hong**, W. Wang and L. Najafizadeh, "ChatBCI: A Fast P300 Speller Brain-Computer Interface Incorporating **Generative AI**-Based Word Prediction," 2024 IEEE Brain Discovery and Neurotechnology Workshop. (Spotlight) – Machine Learning and Computer Paradigms for Brain Discovery

(Under review)
- **J. Hong**, W. Qian, Y. Chen, and Y. Zhang, "A geometric approach to ***k*-means**," submitted
- **J. Hong** and L. Najafizadeh, "TopoEEG: a **TimeSformer**-Based Topographic **Image Representation** Method for Early Single-Trial Detection of P300," submitted

(In Preparation)
- **J. Hong**, W. Wang, S. Haghani, and L. Najafizadeh, "Subject-specific Channel Selection Based on Davies- Bouldin Index for EEG Motor Imagery Classification," in preparation
- **J. Hong**, W. Wang, and L. Najafizadeh, "A Mind-Controlled Speller System Incorporating **LLMs** and P300-Based Brain-Computer Interfaces," in preparation

AWARDS

- Travel Award of 2024 IEEE Brain Discovery & Neurotechnology Workshop *09/2024*
- Best Teaching Assistant Award for Fall 2023, Rutgers ECE *05/2024*