Qichao Wu (Alice)

Philadelphia, PA 19104 · alicewu1@seas.upenn.edu · (719) 201-3820

EDUCATION

University of Pennsylvania PA, USA *expected 2025*
M.E. Computer and Information Technology (part-time, online)

Carnegie Mellon University PA, USA *May 2023*
M.S. Biomedical Engineering. Scholarship: $10000 + 5000 (research excellence), GPA: 3.72

Colorado College CO, USA *May 2020*
B.A., Neuroscience, Minor: Mathematics (Statistical Modeling). Dean's list: 2019-20, GPA: 3.52

SKILLS

Programming: Python (5yrs), MATLAB (4yrs), JAVA, R, SPSS. **Imaging**: FreeSurfer, FSL, ANTs, ITK-snap

Software Packages/Tools: Docker, Git, HPC. Pandas, NumPy, Scipy, Keras, spaCy (NLP), Nibabel, Nilearn

Coursework: Neural Data Analysis (**TA**) | Neural Signal Processing | Systems Neuroscience | Data Inference & Machine Learning | Large-Scale Computing | Intro to Software Development | Statistical Analysis and Machine Learning in Biomedical Science | AI for Medical Diagnosis

RESEARCH & WORK EXPERIENCE

Research Specialist, Detre & RECOVER Lab, Penn Medicine, University of Pennsylvania *Sep 2023 - Present*

- Develop two data pipelines for analyzing ASL MRI and fMRI data, building Docker containers to apply pipelines on computing cluster, and generating HTML reports for medical diagnosis. For the first time, detected robust signal with our task paradigm and data pipeline.
- Collaborate with physicians and technicians in experiment design and data collection. Designed task-based fMRI experiments for coma patients and proposed an NLP with ML method to detect consciousness on a numerical scale, with publication in a top-tier journal.
- Analyze multi-modal imaging data with segmentation and statistical tools to explore brain-eye connectivity across age groups, presenting abstracts at top conferences and finishing up a first-author publication.

Graduate Research Assistant, Smith Lab, Dept. BME, Carnegie Mellon University *Sep 2021 - Jun 2023*

- Built a preprocessing pipeline for neurophysiological data, proposed an SNR metric to assess signal quality, and generated results to PhDs and PI for publication.
- Ran experiments with non-human primates, collecting neurophysiology and behavioral data, and performed analyses to drive insights for experiment design.

R&D Data Science Intern, mentor Dr. Spencer Kellis, Blackrock Neurotech, Salt lake City *Jun - Aug 2022*

- Preprocessed neurophysiological data from MEA across 8,000+ trials, collaborated with team to improve a novel ML algorithm to stabilize signals, constructed a feature matrix with statistical validation, and visualized results for team review.
- Proposed metrics for device calibration and presented findings on potential enhancements to company's brain-computer interface device.

Marketing Intern in Cognitive Assessment Project, Green Valley, Shanghai *Aug - Oct 2020*

- Conducted interviews with doctors and created educational videos for dementia community.

Undergraduate Research, Dept. Psychology, mentor: Dr. Kevin Holmes, Colorado College *Jun - Aug 2019*

- Improved a network inference algorithm for semantic map; presented findings at a top conference.

PUBLICATIONS AND CONFERENCES

- **Wu, Q.**, , Dolui S., Taso M., Jiang H., Morgan J. I. W., Wang J., Shakibajahromi B., Bhavsar R., Aguirre G. K., Detre J. A. (2025). Associations between retinal microvasculature, ocular blood flow, and cerebral blood flow in healthy adults. International Society for Magnetic Resonance in Medicine. Honolulu, HI
- Fischer, D., Edlow, B. L., Freeman, H. J., Alaiev, D., **Wu, Q.**, Ware, J. B., ... & Aguirre, G. K. (2025). Reconstructing covert consciousness: neural decoding as a novel consciousness assessment. *Neurology*, *104*(4), e210208. https://doi.org/10.1212/WNL.0000000000210208
- Shakibajahromi, B., Dolui, S., Brown, C., Taghvaei, M., Khandelwal, P., **Wu, Q.**, ... & Detre, J. A. (2024). MRI Correlates of Executive Function in Cognitively Normal Older Subjects. Alzheimer's & Dementia, 20, e089690. https://doi.org/10.1002/alz.089690
- Shakibajahromi, B., Dolui, S., Brown, C., Taghvaei, M., Khandelwal, P., Sadaghiani, S., **Wu, A.**, Yushkevich, P., Wolk, D. and Detre, J.A. (2024). MRI Correlates of Preclinical Cerebral Small Vessel Disease. ANNALS OF NEUROLOGY. Vol. 96. NJ USA: WILEY. ISSN**:** 0364-5134
- Stan, P. L., & Smith, M. A. (2024). Recent visual experience reshapes V4 neuronal activity and improves perceptual performance. *Journal of Neuroscience*, *44*(41). (**Help with Data Analysis)**
- **Wu, Q.**, Crane, EC., Stan P.L., Smith M. (2022) Quantifying the Recording Quality of Chronically Implanted Intracortical Multi-electrode Arrays. Bioengineering Day.
- **Wu, Q.**, Malmskog, B., & Holmes, K. (2020). Representing Typological Prevalence in Graph-Based Semantic Maps. In Proceedings of the Annual Meeting of the Cognitive Science Society (Vol. 42).

SCHOOL PROJECTS

Chest X-Ray Medical Diagnosis with Deep Learning

- Pre-processed a X-ray dataset (1000+ images), handled class imbalance with weighted loss function, retrained a DenseNet model, and visualized diagnostic performance using GradCAMs.

Classification of General Health Status from Risk Factors

- Analyzed the U.S. health survey dataset with 491k+ records, conducted EDA, feature selection, and ensemble models—Random Forest, XGBoost with oversampling to solve class imbalance.

Data Manipulation of the Large Database - Allen Institute Brain Image Library

- Cleaned the local tables, added new features, and tracked the data flow in the database.

AWARDS AND ACTIVITIES

Science YouTuber (also on Bilibili)

- Produced science videos about neuroscience; the top one has gained 20K+ watches.

2019 Mathematical Contest in Modeling, *American Mathematical Society*

- Our team was awarded as the **meritorious winner**: top 2-6% of 14,108 international teams.