Jiaang Yao

Curriculum Vitae

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Education

2021 – 2026 Berkeley, CA	**University of California, Berkeley/University of California, San Francisco** Ph.D., Bioengineering
2020 – 2021 New York, NY	**Columbia University** M.S., Electrical Engineering
2018 – 2020 New York, NY	**Columbia University** B.S., Electrical Engineering *summa cum laude*, Tau Beta Pi, Joint BA/BS 3-2 Program
2015 – 2020 Middletown, CT	**Wesleyan University** B.A., Biology, Mathematics, Neuroscience and Behavior Phi Beta Kappa, Joint BA/BS 3-2 Program

Research Interests

Neuroengineering and neurorehabilitation: brain-machine interfaces; neuroprosthetics; motor learning; speech encoding and decoding; machine learning; signal processing; deep learning; convex optimization

Research Experience

2020 – 2021 **Research Assistant**, Columbia University Irving Medical Center
Advisor: Jason Carmel

- Currently designing algorithms for triggering spinal cord electrical stimulation at specific phases of local field potential rhythms in real time.
- Currently implementing decoders for predicting forelimb movements in rats using electrocorticography (ECoG) data.
- Performed animal training and administered data recording sessions.
- Configured data collection pipeline and designed experiment protocols.

2018 – 2021 **Research Assistant**, Columbia University
Advisor: Paul Sajda

- Developed a state-space model algorithm for predicting the instantaneous phase of local field potential rhythms in real time.
- Devised multimodal neural network models that utilize features from volumes of optical coherence tomography angiography images for diagnosing neovascular age-related macular degeneration.

- Designed the first recurrent neural network model for ballistocardiogram (BCG) artifact suppression in simultaneous EEG-fMRI recordings that significantly outperformed the current state of the art.
- Implemented an open-source Python toolbox called BCGNet for users to train neural network models for suppressing BCG artifact.

2016 – 2018 **Research Assistant**, Wesleyan University
Advisor: Michael Weir

- Modeled interactions between 530-loop region of ribosome and mRNA during protein translation using support vector machines.
- Performed molecular dynamics analysis of ribosome during protein translation using AMBER.

Fellowships

2021 – 2023 **Berkeley Fellowship for Graduate Study**
Role: Graduate Fellow
$34000

Summer 2019 **Summer@SEAS at Columbia University**
Role: Summer Fellow
$5000

Summer 2016 **QAC Summer Apprentice at Wesleyan University**
Role: Summer Fellow
$4000

Honors and Awards

2020 **Erwin Howard Armstrong Memorial Award**, Columbia University
2018 – 2020 **Dean's List**, All Available Semesters, Columbia University
2019 **Phi Beta Kappa Honor Society**, Fall Induction, Wesleyan University
2019 **Tau Beta Pi Honor Society**, Spring Induction, Columbia University
2015 – 2018 **Dean's List**, All Semesters, Wesleyan University
2017 **Plukas Teaching Apprentice Award**, Wesleyan University

Publications

$*$ authors contributed equally

Peer-Reviewed Journal Articles

J2. K. Thakoor, **J. Yao**, D. Bordbar, O. Moussa, W. Lin, P. Sajda, and R. Chen, "A multimodal deep learning system to distinguish late stages of amd and to compare expert vs. ai ocular biomarkers," *Submitted*, 2021

J1. J. R. McIntosh*****, **J. Yao***, L. Hong, J. Faller, and P. Sajda, "Ballistocardiogram artifact reduction in simultaneous EEG-fMRI using deep learning," *IEEE Transactions on Biomedical Engineering*, vol. 68, no. 1, pp. 78–89, 2021. DOI: 10.1109/TBME.2020.3004548

Peer-Reviewed Conference Proceedings

C1. K. Thakoor, D. Bordbar, **J. Yao**, O. Moussa, R. Chen, and P. Sajda, "Hybrid 3D-2D deep learning for detection of neovascular age-related macular degeneration using optical coherence tomography b-scans and angiography volumes," *2021 IEEE 18th International Symposium on Biomedical Imaging (ISBI)*, pp. 1600–1604, 2021. DOI: 10.1109/ISBI48211.2021.9434111

Presentations

∗ authors contributed equally

Conference Abstracts

A1. K. Thakoor, D. Bordbar, **J. Yao**, O. Moussa, W. Lin, I. Scherbakova, V. Diaconita, P. Sajda, and R. Chen, "A hybrid deep learning system to distinguish late stages of amd and to compare expert vs. machine amd risk features," *Investigative Ophthalmology & Visual Science*, vol. 62, no. 8, pp. 2146–2146, 2021

Poster Presentations

P2. **J. Yao***, Y. Lin*, J. R. McIntosh, L. Hong, J. Faller, and P. Sajda, "BCGNet: A deep learning toolbox for ballistocardiogram artifact suppression in EEG-fMRI recordings," in *2020 IEEE Brain Workshop on Advanced Neurotechnologies*, Oct. 2020

P1. **J. Yao**, J. W. Glickman, D. Krizanc, and M. P. Weir, "Refining a model for rRNA base pairing to mRNA during protein translation," in *17th Annual Biophysics Retreat of Wesleyan University*, Middletown, CT, Sep. 2016

Teaching Experience

Spring 2021	**Course Assistant**, Columbia University ECBM E4040: Neural Networks and Deep Learning
Fall 2020	**Course Assistant**, Columbia University ECBM E4040: Neural Networks and Deep Learning
Spring 2020	**Lab Assistant**, Columbia University ELEN E3082: Digital Electronics Laboratory
Fall 2018	**Teaching Assistant**, Wesleyan University BIOL 181: Principles of Biology I: Cell Biology and Molecular Basis of Heredity
Fall 2016	**Course Assistant**, Wesleyan University ECON 110: Introduction to Economic Theory

Professional Service

Journal Reviewer

Neural Plasticity

Professional Membership

Institute of Electrical and Electronics Engineers (IEEE)
American Society of Biochemistry and Molecular Biology (ASBMB)

Technical Skills

Programming: Python, MATLAB, CUDA, Java, Unity, C
Language: Mandarin (Native), Japanese (Intermediate), Italian (Elementary)