Qinghao Liang

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EDUCATION

Yale University, New Haven, CT
Ph.D, Biomedical Engineering   *Expected Dec 2023*
Selected coursework: Data Mining and Machine Learning, Object-Oriented Programming, Optimization and Computation, Deep Learning Theory and Applications, Harmonic Analysis on Graphs, Unsupervised Learning of Big Data, Mathematical Methods of Physics, Computational Vision, Topics in Numerical Computation

University of Science and Technology of China, Hefei, China
B.S, Physics   *Aug 2014 - June 2018*
Selected coursework: Probability and Statistics, Computational Physics, Quantum Mechanics, Statistical Physics

RESEARCH EXPERIENCES

Yale School of Medicine, Department of Radiology and Biomedical Imaging   **New Haven, CT**
Research Assistant   *Mar 2019 - Present*
- Developed a predictive modeling pipeline of functional connectivity data with missing values in both features and labels.
- Implemented low rank matrix completion and max norm matrix completion algorithms solved by alternating direction method of multipliers to recover missing data.
- Evaluated the performance of different imputation methods in three different datasets by large-scale simulation of different missing patterns on Yale high performance computing clusters.
- Developed connectome transformation framework using graph matching methods and optimal transportation.
- Built and trained Graph Neural Network with Graph Attention Convolution layers using PyTorch Geometric on brain graphs constructed from fMRI data for sex classification and achieved predictive performance comparable to state-of-art methods.

Yale University, School of Engineering and Applied Science   **New Haven, CT**
Research Assistant   *Sept 2018 – Mar 2019*
- Developed dynamical simulation algorithms for protein folding in purely repulsive potential.
- Accelerated Molecular Dynamics simulation of crystallization process of bulk metallic glasses of ternary systems of various compositions using enhanced sampling algorithm Metadynamics.
- Analyzed and visualized kinetic pathways of nucleation using principal component analysis.
- Developed simulation software of granular material in C++ using Conjugate Gradient methods.
- Developed MATLAB toolbox for particle rearrangement detection and force distribution visualization.

PUBLICATIONS

Qinghao Liang, Dustin Scheinost. Imputation of Missing Behavioral Measures in Connectome-based Predictive Modeling. Workshop Artemiss, International Conference on Machine Learning, 2020

Qinghao Liang, Sahand Negahban, Joseph Chang, Harrison H. Zhou, Dustin Scheinost. Connectome-based Predictive Modeling with Missing Connectivity Data Using Robust Matrix Completion. International Symposium on Biomedical Imaging, 2021

Qinghao Liang, Javid Dadashkarimi, Wei Dai, Amin Karbasi, Joseph Chang, Harrison H. Zhou, Dustin Scheinost. Transforming connectomes to "any" parcellation via graph matching. 4th Workshop on GRaphs in biomedicAl Image anaLysis, MICCAI 2022

TEACHING AND PROJECT MANAGEMENT EXPERIENCE

Yale University, Wu Tsai Institute
Graduate Student Leader (Summer 2021)

- Mentored undergraduate students on summer research and poster presentation.
- Hosted a career event and invited graduated students working in industry to give talks about their career paths.

Yale University, School of Engineering and Applied Science
Teaching Fellow, Medical Software Design Introduction (Spring 2021) & Introduction to Engineering, Innovation and Design (Fall 2021)
- Supervised medical software design and implementation of two teams in collaboration with doctors and researchers from Yale School of Medicine.
- Led weekly lab sessions of 15 students to design and build prototypes of original devices for Yale clients.
- Demonstrated and guided students through circuits design and single-board microcontrollers programming.

SKILLS
Computer Skills: Python, R, MATLAB, C, C++, Latex
Language: Mandarin, English