Qingfang Liu

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Professional Summary

- 8+ years of experience in qualitative and quantitative research, specializing in analyzing complex human data and developing efficient, scalable workflows.
- Multidisciplinary background combining psychology (user-centered experiment design, A/B testing, surveys) with statistical rigor and computational modeling expertise.
- Neural-AI innovator with a track record of applying advanced ML/DL models (e.g., variational autoencoders, graph neural network) to uncover causal brain–behavior relationships with clinical relevance.

Skills

Programming Languages: Python, R/RStudio, SQL, MATLAB, Git, Github

Machine Learning: PyTorch, PyG, TensorFlow, Keras, Scikit-learn

Bayesian Methods & Optimization: Bayesian inference, MCMC, variational inference, hierarchical modeling

Big Data & Cloud: PySpark, SparkSQL

Data Processing & Visualization: Pandas, NumPy, dplyr, ggplot2, tidyverse

Experience

Research Fellow *04/2022 – Present*

National Institutes of Health - Baltimore, MD, US

- Applied **inferential statistical methods** (e.g., t-tests, ANOVA, mixed-effects models) to analyze behavioral, neuroimaging, and clinical data across studies (across >500 sessions), performing **hypothesis testing** to draw group-level conclusions.
- Integrated **reinforcement learning (Q-learning)** with a **hierarchical Bayesian model** to explain neuromodulation outcomes and support **causal inference**, reconciling neural and behavioral data across >300 trials from 31 human participants.
- Developed **conditional variational autoencoders (VAEs)** to decode latent brain network dynamics from resting-state fMRI from more than 300 sessions, enabling measurement of neuromodulation effects that aligned with behavioral changes.
- Designed a **hybrid Autoencoder–Graph Neural Network (GNN) framework** to segment brain subregions from fMRI-derived functional connectivity, addressing the challenge of integrating global connectivity patterns with local spatial information for brain parcellation; improved clustering coherence across human participants by 17% compared to K-means baseline.
- **Automated ETL pipeline** for fMRI and behavioral datasets (~100 sessions), cutting preprocessing time from 2 hours per session to under 20 minutes and ensuring consistency across 5+ downstream analyses.

Postdoctoral Fellow *02/2021 – 03/2022*

Northwestern University Feinberg School of Medicine - Chicago, IL, US

- **Initiated cutting-edge research** on frontal cortex–midbrain function, contributing novel theoretical insight with clinical relevance; results published in *Nat. Commun.* (<10% acceptance rate), presented at invited conferences, and featured by NIH media.
- Led functional MRI (fMRI) and transcranial magnetic stimulation (TMS) **experimental design** using olfactory and visual stimuli across 3 studies (~300 sessions), overseeing **survey design, UI flow, and A/B testing** to optimize participant experience; resolved technical challenges in precisely synchronizing odor delivery with MRI acquisition.
- **Managed day-to-day staff operations**, including training, task coordination, and scheduling, to ensure smooth execution of neuroimaging studies involving complex experimental protocols and multi-session data collection.
- **Mentored and supervised** research assistants and summer interns, guiding independent research projects, reviewing code and experimental scripts, and fostering strong analytical and problem-solving skills.

Highlighted Projects

Extreme Weather Forecasting in Bhutan — Omdena Project GitHub Repo 06/2025 – Present

Omdena is a global platform for collaborative AI projects addressing real-world problems. (omdena.com)

- Built an **end-to-end system** to forecast extreme weather events (e.g., floods) using **multivariate time-series data** from ERA5 reanalysis (e.g., rainfall, temperature, humidity) and Bhutan's in-country meteorological stations.
- Designed and implemented an **ETL pipeline** using Python, CDS API, and xarray to fetch GRIB-format climate data from online repositories, automate preprocessing, and structure it for downstream modeling.
- Trained, fine-tuned and evaluated **ML/DL models (XGBoost, LSTM, GRU, and Transformer-based models)**; conducted extensive EDA, feature engineering, hyperparameter tuning and cross-validation.
- Co-developed the **MVP** and project roadmap with the project manager.
- Collaborated with an **international project team** and engaged **local stakeholders** to align model objectives with operational needs.

Education

PhD, Psychology *08/2016 – 01/2021*
Ohio State University - Columbus, OH, US *GPA: 3.9/4.0*

Master's, Statistics *08/2016 – 05/2019*
Ohio State University - Columbus, OH, US *GPA: 3.7/4.0*

Bachelor's, Psychology *09/2012 – 07/2016*
Beijing Normal University, Beijing, China *GPA: 4.0/4.0*

Certifications

- Generative AI with Large Language Models (DeepLearning.AI / AWS)
- Machine Learning Specialization (Coursera / Stanford)
- Deep Learning Specialization (Coursera / Stanford)
- SQL for Data Science (Coursera / UC-Davis)