Keming Liu

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EDUCATION

Wesleyan University, Middletown, CT May 2027
Bachelor of Arts, GPA: 3.93/4.00, Dean's List every semester
Majors: Biology and Mathematics **Minor:** Informatics and Modeling
Relevant Coursework: Discrete Mathematics; Topology; Vectors and Matrices; Multivariable Calculus; Introduction to Abstract Algebra; Mathematics in Quantum Computing; Hormones, Brain, and Behavior; Bioinformatics; Principles of Biology I & II and related Lab; General Chemistry I & II and related Lab; Behavior Neurobiology

Scholarships and Awards:
Quantitative Analysis Center (QAC) Apprenticeship, Wesleyan University
Selected to conduct applied quantitative analysis, collaborating on a data-driven project
AFS Global STEM Academies Full Scholarship, American Field Service (AFS)
Selected to complete an intensive global program focused on scientific innovation, cross-cultural collaboration, and real-world problem solving
YINGCAIJIHUA (Youth Talent Program), Nanjing University
Selected through school nomination, application review, and competitive interviews to conduct mentored research in a university laboratory across core STEM disciplines

SKILLS

Computational: Python, R, MATLAB, BLAST, Pandas, ggplot2, Seaborn, scikit-learn, TensorFlow, SPSS, Git, HPC, NumPy, Regression, Time-Series Analysis, Coherence, PAC, Granger Causality, ANOVA
Wet Laboratory: PCR / qPCR; plasmid construction and purification; immunohistochemistry (IHC), including tissue fixation, sectioning, antibody staining, and confocal fluorescence imaging; rodent behavioral assays, including Elevated Plus Maze (EPM) and Open Field Test
Languages: Fluent in both English and Chinese

TRAINING & APPLIED ML PROJECTS

Student Trainee, **Ignite AI Accelerator**, **AI4ALL**, Remote September 2025 – Present

- Developed a COVID-19 cough classification model from raw audio using Python and a CRNN network, including preprocessing (noise reduction, MFCC extraction), feature engineering, and k-fold cross-validation.
- Analyzed model performance with ROC-AUC, PR-AUC, confusion matrices, and F1-optimized thresholds; implemented data-imbalance handling and bias-mitigation.
- Collaborated with peers and mentors using GitHub version control, Agile project planning (SMART goals, RACI charts), and weekly workshops covering CV, NLP, statistical models, and AI governance.

Deep Learning Scholar, **Neuromatch Academy**, Remote July 2025

- Completed an intensive, project-based deep learning curriculum covering optimization, CNNs, RNNs, attention/transformers, self-supervised learning, and reinforcement learning.
- Built and optimized neural network models in PyTorch, applying techniques such as backpropagation, regularization, batch normalization, and modern optimization algorithms.
- Developed a motor-intention decoding pipeline with an international peer cohort, training LSTM-based recurrent networks to predict left/right movement decisions from MOp/MOs cortical spike trains.

RESEARCH EXPERIENCE

Research Assistant, **Machine Psychometrics and Computational Creativity Lab (Prof. Laverghetta)**
Wesleyan University, Middletown, CT September 2025 – Present

- *Project: Disentangling Creativity Measurement from Statistical Artifacts in Machine Learning Models*
- Building SHAP- and LOFO-based interpretability pipelines and running them on HPC clusters to evaluate feature importance, model robustness, and sensitivity in creativity prediction models.

- Performing token-level and feature-level attribution analyses across ensemble and transformer architectures to identify linguistic patterns driving creativity scores.
- Selected to present an overview in March in Data Insights, a student-speaker series at Wesleyan.

Research Assistant, **Melón Lab, Wesleyan University**, Middletown, CT March 2025 – Present

- *Project: Statistical Approaches for Neural Oscillation and Social Behavior Analysis in the VTA*
- Analyzed VTA–PFC LFP signals using time-series methods, coherence, phase–amplitude coupling, and Granger causality to link circuit dynamics with social behavior and ethanol intake
- Integrated behavioral segmentation with neural data and mixed-effects models to examine directional connectivity and individual variability in affect-modulated circuit communication
- Presented my work through Summer symposium in 2025 and Research Pathway in 2026 to over 200 students.

Research Assistant, **Mandalaywala Lab, Boston University***, MA* March 2024 – July 2024

- Recruited 50+ participants and interviewed for a study on beliefs about social mobility in young children.
- Checked and analyzed qualitative and quantitative data from interviews to contribute to research insights.

Research Assistant, **Pu Lab, Chinese Academy of Sciences**, Shanghai, China July 2023 – August 2023

- Interned at Gene Editing & Functional Screening Lab, assisting in conducting experiments and acquiring laboratory techniques, including plasmid construction, which enhanced understanding of gene editing.

Research Assistant, **Zhuang Lab, Nanjing University**, Nanjing, China March 2022 – October 2022

- *Project: Remission of anxiety by Capsaicin treatment*
- Established a 21-day chronic restraint stress mouse model and conducted behavioral assays (Elevated Plus Maze, Open Field Test) to evaluate the anxiolytic effects of capsaicin.
- Performed ROS fluorescence analysis of brain tissue and applied ANOVA and t-tests (GraphPad Prism) to link anxiety-like behavior improvement with reduced oxidative stress.
- Presented research findings at the Jiangsu High School Students' Science Symposium, communicating results to a provincial-level audience of high school students and university faculty through a poster presentation.

MENTOR & TEACHING EXPERIENCE

Course Assistant, **Deep Learning and Large Language Models: An Introduction, Wesleyan University**, Middletown, CT January 2026 – Present

- Assisted the instructor by reviewing and checking course materials, and providing in-class support for deep learning and large language model concepts.
- Held office hours to help students with coursework, debugging, and conceptual understanding.

Mentor, **Wesleyan Women in Science, Wesleyan University**, Middletown, CT September 2025 – Present

- Mentored 2 freshmen women in STEM through academic advising and peer support, fostering persistence and confidence in scientific pathways

Peer Tutor, **Dean's Tutoring Program, Wesleyan University**, Middletown, CT September 2025 – December 2025

- Facilitating one-on-one and small-group sessions to clarify foundational concepts in introductory biology, supporting students with a range of learning backgrounds.
- Translating complex biological processes into clear, accessible explanations, strengthening my communication and mentoring skills through weekly structured sessions.

Alumni Mentor, **AFS Global STEM Academies**, Remote January 2025 – June 2025

- Mentored scholars worldwide in a 12-week STEM enrichment program through the Bridge forum, providing guidance during weekly live sessions and supporting students' independent capstone projects.

Interests

Team Dancing – Korean Dance Crew, Cooking – All types of Chinese cuisine, Global Travel – North America, Europe, Asia, and Australia, Singing – Soprano and Jazz