# Fujia Wu

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## Research Interests

Neural population dynamics and coding, computational models of cognition and behavior, generalization of neural representations across recording sessions.

## Education

**Juntendo University | Tokyo, Japan**
*Master's Program in Health Data Science, Graduate School of Health Data Science* Apr 2025 - Mar 2027 (expected)

- Laboratory: Himeno-Sun Lab
- Supervisors: Prof. Ryutaro Himeno & Prof. Zhe Sun
- GPA: 3.48/4.00

**Xi'an Jiaotong-Liverpool University | Suzhou, China**
*BSc (Hons) Information and Computing Science, Upper Second-Class Honours* Sep 2020 - Jun 2024
*(Dual degree with the University of Liverpool)*

- GPA: 3.30/4.00

## Research Outputs & Presentations

- **Fujia Wu**, Yunyu Huang, Xiyang Sun, Zhe Sun, Xiaowei Gu, and Chao Li. "AI meets Neural Spike Sequence Modeling." *Manuscript in preparation.*
- Yunyu Huang, **Fujia Wu**, Dairui Chen, Xiaowei Gu, Zhe Sun, and Chao Li. "TensorSpike: Tractable Probabilistic Modeling for Neural Spike Trains with Tensor Networks." *CoLoRAI Workshop at ICML 2026. [Poster]*
- **Fujia Wu**, Zhe Sun, Xiaowei Gu, and Chao Li. "Pretraining and Parameter-Efficient Adaptation for Rat Neural Dynamics Modeling." *3rd Digital Brain Workshop 2026, Chiba, Japan, Oct 10-12, 2026. [Poster Presentation]*
- **Fujia Wu**, Zhe Sun, Xiaowei Gu, and Chao Li. "Modeling Rat Neural Activity with Transformers Across Single-Neuron and Multi-Neuron Scales." *2nd Digital Brain Workshop 2025, Oita, Japan, Oct 17-19, 2025. [Poster Presentation]*

## Research Experience

**Brain/MINDS 2.0 Digital Brain Project | Juntendo University**
*Graduate Research Student, Himeno-Sun Lab* Apr 2025 - Present

- Adapt and evaluate Transformer-based neural sequence models on in-house rat neural recordings and public datasets, including NLB'21 and Allen Visual Coding–Neuropixels.
- Assess neural activity reconstruction, held-out neural prediction, activity generation, and behavioral decoding using likelihood-based and task-specific metrics, including co-bps and PSTH $R^2$.
- Investigate model generalization across trials, recording sessions, and animals, characterizing performance degradation under sparse and limited-data conditions.
- Compare pretraining and parameter-efficient fine-tuning (LoRA and DoRA) under limited-data and cross-session adaptation settings.
- Conduct model training on the Fugaku supercomputer (CPU nodes) and the Brain/MINDS 2.0 GPU server.

**BERT-Based NLP System for Production Safety | Xi'an Jiaotong-Liverpool University**
*Undergraduate Dissertation Project* Sep 2023 - Jun 2024

- Designed a conceptual NLP system and trained a BERT model on enterprise production-safety records, exploring text classification, risk-level recognition, and information extraction.

## Skills & Languages

- Programming & Tools: Python (PyTorch, NumPy), C++, Linux, Git, Conda
- Machine Learning: Transformer-based neural sequence modeling, parameter-efficient fine-tuning
- Mathematical Foundations: Linear algebra, calculus, tensor algebra, introductory tensor-network methods
- Neural Data & Benchmarks: Spike trains, calcium imaging; NLB'21 (nlb_tools); Allen Visual Coding–Neuropixels
- High-Performance Computing: Linux-based HPC environments, CPU/GPU model training
- Languages: Chinese (Native), English (IELTS Academic 7.0, no band below 6.5), Japanese (Conversational Proficiency)

## Academic Service

- Reviewer, *CoLoRAI Workshop at ICML 2026*