Weihan Li

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Education

- **Georgia institute of technology** — *Atlanta, USA*
  Ph.D student in Machine Learning — *Sep, 2023 - now*
- **Zhejiang University** — *Hangzhou, China*
  Graduate student in Computer Science and Technology — *Sep, 2020 - June. 2023*
- **Zhejiang University** — *Hangzhou, China*
  Bachelor of Computer Science and Technology; — *Aug, 2016 - Jul, 2020*

PUBLICATIONS

- **Li W**, Wang Y, Li C, Wu A. Markovian Gaussian Process: A Universal State-Space Representation for Stationary Temporal Gaussian Process, *preprint*. [link]
- Wang Y, Li C, **Li W**, Wu A. Exploring Behavior-Relevant and Disentangled Neural Dynamics with Generative Diffusion Models, **NeurIPS 2024**. [link]
- **Li W**, Li C, Wang Y, Wu A. Multi-Region Markovian Gaussian Process: An Efficient Method to Discover Directional Communications Across Multiple Brain Regions, **ICML 2024**. [link]
- Li C, **Li W**, Wang Y, Wu A. A Differentiable POGLM with Forward-Backward Message Passing, **ICML 2024**. [link]
- Li C, Wang Y, **Li W**, Wu A. Forward χ^2 Divergence Based Variational Importance Sampling, **ICLR 2023**. [link]
- **Li W**, Qi Y, Pan G, Online Neural Sequence Detection with Hierarchical Dirichlet Point Process, **NeurIPS 2022**. [link]
- **Li W**, Qian C, Qi Y, Wang Y, Wang Y, and Pan G. Efficient Point-Process Modeling of Spiking Neurons for Neuroprosthesis, **EMBC 2021**. [link]

Core Expertise

- Generative AI: LLM post-training, reinforcement learning, probabilistic and generative modeling, and diffusion models.
- Sequence Modeling: Efficient State Space Models, linear RNNs, Transformers with long-sequence capabilities.
- Applications: Scalable neural data analysis, neuroscience-informed generative modeling, and brain-computer interfaces.
- Programming: Proficient in Python, PyTorch, Matlab, and JAX.

RESEARCH PROJECTS

- **LLM Post-Training for Domain-Specific Agent** — *Nov, 2024 – Present*
  - Developing a domain-specific expert agent by fine-tuning LLM using RLHF to optimize performance on specialized tasks, ensuring high accuracy, reliability, and adaptability to domain-specific requirements.
- **Developing Efficient Sequence Modeling Methods for Large-Scale Neural Data** — *Sep, 2024 - Present*
  - Developing deep State Space Model (Transformer with gated linear attention) to explore the brain networks with large-scale neural data.
- **Uncovering Neural Dynamics with Generative Diffusion Models** — *Jan, 2024 - May, 2024*
  - Developed models to identify key brain activity patterns related to behavior using advanced generative diffusion techniques, improving the understanding of neural processes involved in cognition.
- **Combining Gaussian Processes with State Space Models for Large-Scale Data** — *Jan, 2024 - May, 2024*
  - Established a universal connection between state space models and temporal Gaussian Processes, enhancing computational efficiency and improving the analysis of large neuroscience datasets.
- **Efficient Brain Connectivity Analysis Using Gaussian Process** — *Sep, 2023 - Jan, 2024*
  - Developed a state space model to imitate Gaussian Processes and study communication between brain regions, with a focus on detecting signal flow and oscillations in the brain.
- **Improving Variational Sampling with Forward χ^2 Divergence** — *May, 2023 - Sep, 2023*
  - Introduced a new technique to enhance the accuracy of statistical models by improving how data is sampled in variational inference, leading to better performance in machine learning models.
- **Real-Time Detection of Neural Activity Patterns** — *Jan, 2022 - May, 2022*
  - Created a real-time method for detecting patterns in neural data, making it more efficient for large and growing datasets.