

Kaiwen Bian

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Education

- 2022 – 2026 **University of California, San Diego**, La Jolla, CA
B.S. in Data Science, Major-GPA 3.891/4.0
B.S. in Cognitive Behavioral Neuroscience, Major-GPA 3.875/4.0
Research Interests: Embodied Agent, State-Space Planning, Representation Learning, Computational Neuroscience, Graph Generation.

Research Experience

- 2025 – 2026 **University of California, San Diego**, *Student Researcher*, La Jolla, CA.
Halicioğlu Data Science Institute
Advisor: Yusu Wang
 - Designing a motif-preserve graph tokenization scheme, allowing sequence transformers to model long-range graph topology more effectively and generate biological graphs (i.e. molecules, proteins, brain networks) more accurately.
 - Co-advised on the topological clustering project from Salk.
- 2025 – 2026 **Stanford University**, *Visiting Research Scholar*, Palo Alto, CA.
Statistics Department & Wu Tsai Neurosciences Institute
Advisor: Scott W Linderman
 - Created latent dynamical models for planning and generating diverse and bio-mechanically realistic behaviors for embodied agents using deep state-space modeling methods.
- 2024 – 2026 **Salk Institute for Biological Studies**, *Research Intern*, La Jolla, CA.
Crick-Jacobs Center for Theoretical and Computational Biology
Advisor: Talmo D Pereira
 - Developed computationally efficient deep reinforcement imitation systems (MIMIC-MJX) to control a bio-mechanically realistic agent and mimic realistic animal behaviors.
 - Developed topological clustering method using neuromechanical embodied agent and discrete Morse graphs for revealing animal "*behavioral-basis*" and segmenting stereotypical animal behaviors.
- 2023 – 2024 **University of California, San Diego**, *FMP Scholar*, La Jolla, CA.
Cognitive Science Department & Undergraduate Research Hub
Advisor: Sean Trott
 - Developed tools using linguistic techniques (i.e. affordance) for probing the embodied simulation in large multi-modal models to improve the interpretability of these models.

Conference Manuscripts & Journal Publications

- Nature Methods 2026 Zhang, C.Y., Yang, Y., Sirbu, A., Leonardis, E.J., Abe, E., Warnberg, E., Aldarondo, D.E., Lee, A., Prasad, A., Foat, J., **Bian, K.**, Park, J., Bhatt, R., Saunders, H., Nagamori, A., Thanawalla, A.R., Huang, K.W., Plum, F., Beck, H., Flavell, S.W., Labonte, D., Richards, B.A., Brunton, B.W., Azim, E., Ölveczky, B.P., & Pereira, T.D. (2026). [MIMIC-MJX: Neuromechanical Emulation of Animal Behavior](#). Manuscript submitted to *Nature Methods*.
- NeurIPS 2026 **Bian, K.**, Leonardis, E. J., Yang, Y., Zhang, C., Azim, E., Ölveczky, B. P., Wang, Y., & Pereira, T. D. (2026). [Topological Clustering of Neuromechanical Agent's Naturalistic Behavior](#). *Manuscript in preparation to submit*.

Conference Posters & Presentations

- UCSD/HDSI 2026 **Bian, K.**, Yang, A. H., Mishne, G., & Wang, Y. (2026). Motif-preserving Graph Tokenization for Biological Structure Generation using Sequence Transformer. *Poster will be presenting at Halicioğlu Data Science Institute, UC San Diego Senior Capstone Showcase, La Jolla, CA.*
- COSYNE 2026 **Bian, K.**, Jha, A., Buchanan, K., Zhang, C., Yang, Y., Leonardis, E., Pereira, T. D., & Linderman, S. W. (2026). [Linking Segmentation and Generation of Behavior with Neuromechanical Embodied Control](#). *Submitted to the Computational and Systems Neuroscience (COSYNE) Conference, Lisbon, Portugal.*
- Stanford/SURP 2025 **Bian, K.**, Jha, A., Buchanan, K., & Linderman, S. W. (2025). [Deep State Space Controls For Biomechanically Realistic Artificial Agents](#). *Poster presented at Stanford Undergraduate Research Program (SURP-Stats) Symposium, Palo Alto, CA.*
- SfN 2025 **Bian, K.**, Leonardis, E. J., Yang, Y., Zhang, C., Azim, E., Ölveczky, B. P., Wang, Y., & Pereira, T. D. (2025). [Topology-driven Insights into Naturalistic Behavior from Neuromechanical Agent Modeling](#). *Poster presented at the Society for Neuroscience (SfN) Annual Meeting, San Diego, CA.*
- SfN 2025 Yang, Y., Zhang, C., Leonardis, E. J., Sirbu, A., **Bian, K.**, Azim, E., Ölveczky, B. P., & Pereira, T. D. (2025). [VNL-playground: Fast and Biologically Realistic Virtual Environment for Simulating Animal Behavior](#). *Poster presented at the Society for Neuroscience (SfN) Annual Meeting, San Diego, CA.*
- COSYNE 2025 Zhang, C., Yang, S., **Bian, K.**, Abe, E., Wörnberg, E., Foat, J., Aldarondo, D., Brunton, B. W., Ölveczky, B. P., & Pereira, T. D. (2025). [Track-MJX: A GPU-Accelerated Pipeline for Imitating Animal Motor Control](#). *Poster presented at the Computational and Systems Neuroscience (COSYNE) Conference, Montreal, Canada.*

UCSD/URH **Bian, K.**, Li, A., Jones, C., & Trott, S. (2023). [Embodied Simulation in Multimodal](#)
2023 [Models Using Affordance Stimulus: A Probing Study](#). *Poster presented at the UC*
San Diego Undergraduate Research Faculty Mentorship Program (FMP) Symposium,
La Jolla, CA.

Skills

Programing Python, SQL, Java, Java Script, Web Dev.

Python Jax, Flax, Ray, MuJoCo/MJX, Gym, Dm-Control, Brax, PyTorch (Torch, TorchRL,
Packages and PyG), TensorFlow, Ripser, SkLearn, Panda, Dask, and Spark.

Mathematic Probability & Statistics (State Space Models, Probabilistic Inference, Stochastic
Processes, and Computational Stochastic), Reinforcement Learning, Convex Opti-
mization, Dynamical System, Linear Algebra, Linear Control Theory, Graph Theory,
and Computational Topology.

Neuroscience System & Cognitive Neuroscience, Neuro-anatomy, Motivational & Developmen-
& Biology tal Neurobiology, Behavioral Endocrinology, Exercise Physiology, Kinesiology, and
Human Nutrition.

Language Mandarin Chinese and English