Gengshuo "John" Tian

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Education

2020 – present	PhD Program in Computational and Applied Mathematics at the **University of Chicago** Advisor: Prof. Brent Doiron
2019 – 2020	PhD Program in Mathematics at the **University of Pittsburgh** Advisor: Prof. Brent Doiron
2015 – 2019	BSc in Mathematics and Applied Mathematics, **Beijing Normal University**

Experience

Current
Sep 2019 — Research in Doiron Theoretical Neuroscience Group
at the University of Pittsburgh and the University of Chicago
Instructor: Prof. Brent Doiron

Studying the geometry of neural variability using random matrix theory and collaborating with experimental neuroscientists to verify the theoretical predictions.

Jun 2019
Sep 2018 — Undergraduate thesis project in Neural Information Processing Lab
at Peking University
Instructor: Prof. Si Wu

Studied the fast response property of balanced networks.

Aug 2018
Jun 2018 — Volunteering in Computational Neurobiology Laboratory
at Salk Institute
Instructor: Prof. Terrence Sejnowski

Worked with Dr. Dongsung Huh to analyze the mechanisms of a spiking neural network trained with gradient descent.

Mar 2018
Sep 2017 — Undergraduate research in Neural Information Processing Lab
at Beijing Normal University
Instructor: Prof. Si Wu

Worked on the theoretical analysis of a model of hierarchical memory retrieval with feedback modulation in hierarchical Hopfield networks.

Publications

[1] **Tian, G.**, Huang, T., & Wu, S. (2019). Excitation-Inhibition Balanced Spiking Neural Networks for Fast Information Processing. In *IEEE International Conference on Systems, Man and Cybernetics* (pp. 249-252).

[2] Liu, X., Zou, X., Ji, Z., **Tian, G.**, Mi, Y., Huang, T., Wong, K. M., & Wu, S. (2019). Push-pull Feedback Implements Hierarchical Information Retrieval Efficiently. In *Advances in Neural Information Processing Systems* (pp. 5702-5711).

[3] **Tian, G.**, Li, S., Huang, T., & Wu, S. (2020). Excitation-inhibition Balanced Neural Networks for Fast Signal Detection. *Frontiers in Computational Neuroscience*, 14, 79.

[4] Liu, X., Zou, X., Ji, Z., **Tian, G.**, Mi, Y., Huang, T., Wong, K. M., & Wu, S. (2022). Neural feedback facilitates rough-to-fine information retrieval. *Neural Networks*.

Talks and conference presentations (by topic)

Relating network heterogeneity to the dimension of population covariability
Sep 2023 Bernstein Conference (poster) Berlin, Germany