Eva Yi Xie

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Education

Princeton University *Princeton, NJ*

Ph.D. in Cognitive Quantitative & Computational Neuroscience *Sep 2024 - present*

- Centennial Fellowship (awarded to the entire duration of graduate study; 1 of 3 neuroscience recipients upon admission).
- Rotation Lab Advisors: Jonathan Pillow (current).

Massachusetts Institute of Technology *Cambridge, MA*

B.S. in Mathematics and in Artificial Intelligence & Decision-making (double majors) *Sep 2020 - May 2024*

- GPA: 4.94/5.0 (Eta Kappa Nu). Concentration in Economics.

Research Experience

June 2024-present	**Visiting Scientist; Intern**, Theory & Modeling Group at Allen Institute (PI: Stefan Mihalas)
Sep 2023-present	**Research Affiliate; Undergrad researcher**, Fiete Lab at MIT McGovern Institute (PI: Ila Fiete)
Jan 2022-June 2024	**Research Affiliate; Undergrad researcher**, Poggio Lab at MIT CBMM (PI: Tomaso Poggio)
Sep 2022-June 2023	**Mason Scholar for SuperUROP**, Madry Lab at MIT CSAIL (PI: Aleksander Madry)
Feb 2021-Jan 2022	**Undergrad Researcher**, Biomechatronics Group at MIT Media Lab (PIs: Hugh Herr & Ed Boyden)
June 2019-Nov 2019	**Research Intern**, Andolfatto Lab at Dept. of Biology, Columbia University (PI: Peter Andolfatto)

Publications

* denotes equal contributions. ‡ denotes presenting author.

Workshop Paper & Presentations

Xie, Y.*‡, Li, Y.*, Ranganmani, A. (2023). Skip Connections Increase the Capacity of Associative Memories in Variable Binding Mechanisms. *NeurIPS Associative Memory & Hopfield Networks* in New Orlean, LA. [paper][code]

Conference Long Abstracts & Presentations

Xie, Y.‡, Hwang, J., Brody, C., Tank, D., Fiete, I. (2024). A Multi-region Brain Model to Shed Light on the Role of Hippocampus in Spatially Embedded Decision Tasks. Presented as the first author at *Cognitive Computational Neuroscience (CCN) 2024* in Cambridge, MA, ***and*** at *Annual Neuroscience Conference (SfN) 2024* in Chicago, IL. [abstract]

Xie, Y.‡, Rangamani, A., Miller E., Poggio T. (2023). Synaptic Plasticity Explains the Creation and Convergence of Ensembles During Interhemispheric Transfer of Working Memory. Presented as the first author at *Annual Neuroscience Conference (SfN) 2023 in Washington, D.C.* [abstract]

Xie, Y.*, Li, Y.*, Ranganmani, A.‡ (2023). Skip Connections Increase the Capacity of Associative Memories in Variable Binding Mechanisms. *Cognitive Computational Neuroscience (CCN) 2023* in Oxford, UK, ***and*** at *Computational Neuroscience Society Meeting (CNS) 2023* in Leipzig, Germany, ***and*** at Lake Conferences in Allen Institute, Seattle, MA. [paper][code]

In Review

Xie, Y., Hwang, J., Brody, C., Tank, D., Fiete, I. A Multi-region Brain Model to Elucidate the Role of Hippocampus in Spatially Embedded Decision Tasks. **Intermediate results under review at *International Conference on Learning Representations* (ICLR) 2025**.

Xie, Y., Mihalas, S., Kuśmierz, L. Slow Transition to Chaos and Robust Reservoir Computing in Recurrent Neural Networks with Heavy-tailed Distributed Synaptic Weights. **Under review at *Computational and Systems Neuroscience* (COSYNE) 2025 and in perp for journal submission**.

In Prep

Xie, Y., Hwang, J., Brody, C., Tank, D., Fiete, I. A Multi-region Brain Model to Elucidate the Role of Hippocampus in Spatially Embedded Decision Tasks. **Further results with experimental verification in preparation for journal**.

Other Memos

Xie, Y.*‡, Engstrom, L.*, Madry, A. (2023). Is Network Dissection Confounded by the Spurious Correlation? Presented to MIT School of Engineering. [abstract]

Xie, Y. and Rangamani, A. (2022). Understanding the Role of Recurrent Connections in Assembly Calculus. *Center for Brains, Minds and Machines (CBMM) Memo 137*. [paper]

Industry R&D Experience

Summer 2023	**IBM Research, Machine Learning R&D Intern**, Cambridge, MA
January 2023	**Microsoft, Machine Learning R&D Intern**, Microsoft AI Development Acceleration Program, MA
Summer 2022	**Meta, Full Stack Software Engineering Intern**, Facebook App Monetization ENG, Menlo Park, CA
Summer 2021	**Facebook, University Engineering Intern (iOS)**, Menlo Park, CA

Selected Awards, Fellowships, & Grants

2024-2029	**Centennial Fellowship**, Princeton University (1 of 3 fellows awarded in Neuroscience)	
	First year tuition & stipend (Centennial Fellowship)	–
	Premium stipend supplement (Centennial Fellowship)	*+$4,000/yr*
2024	**MIT Dean of Science Fellowship**, MIT (1 of 20 fellows in School of Science; declined)	
	Support for first 3 years of PhD study (Dean of Science Fellowship)	–
	Discretionary Fund (Dean of Science Fellowship)	*$10,000*
2022	**D.E. Shaw Discovery Fellowship**, D.E. Shaw & Co. (1 of 37 recipients, 2 at MIT)	*$ 1,500*
	Excellence in Teaching & Learning Award in Math, MIT Math Department (1 of 4 awarded)	*$ 1,000*
2020	**Bloomberg Grace Hopper Conference Scholar (Travel Grant)**, Bloomberg & National Center for Women and Information Technology (1 of 20 selected)	–
2020	**Minor Planet #17245 YiXie**, LINEAR Program of MIT Lincoln Lab & Society for Science (for research excellence demonstrated at young age as a finalist in Science Talent Search)	*NA*
2020	**Top 40 Finalist at Regeneron Science Talent Search**, Society for Science (selected among 2,000+ entrants based on original scientific research, and achievement and leadership)	*$ 29,000*

Presentations

Invited Talks

Feb 2024. *A Multi-region Brain Model to Elucidate the Role of Hippocampus in Spatially Embedded Decision Tasks*. Invited talk: BRAIN CoGS at Princeton Neuroscience Institute.

Oct 2023. *Insights from Assembly Calculus: Its Structure & Application in Neuroscience*. Invited talk: MIT Theory of Distributed Systems Group, Cambridge, MA.

Conference Presentations

For other presentations, please refer to Publication section above. Here ‡ denotes presenting author.

Nov 2022. **Xie, Y.‡**, Li, Y., Ranganmani, A. *Capacity of Associative Memories and Models of Working Memory in Assembly Calculus*. Poster: Advances in the Quest to Understand Intelligence [event], Cambridge, MA.

Teaching Experience

Winter 24	**6.S191 Intro to Deep Learning**, Teaching Assistant [website]	*MIT EECS*
Winter 23	**6.S191 Intro to Deep Learning**, Teaching Assistant [website]	*MIT EECS*
Spring 22	**18.600 Probability & Random Variables**, Teaching Assistant [website]	*MIT Math*

Selected Outreach & Professional Development

Peer Review

Computational and Systems Neuroscience (COSYNE) Conference 2025.
Cognitive Computational Neuroscience (CCN) Conference 2023, 2024.

Service

2024-now **Mentor for PROJECT SHORT.** Shrink the socioeconomic gap in graduate school by mentoring underrepresented students on graduate school application and process.

2023-2024 **Chair of MIT Judicial Review Board.** Oversee election & UA operation; rule on ambiguity and concerns regarding interpretation of constitution and governing documents. *MIT UG Association*

2023-2024 **Cabinet Member of MIT Presidential Advisory Cabinet (PAC).** 1 of 3 undergrad nominated and selected to advise MIT President, Sally Kornbluth, with student insight and perspective on a broad range of topics. Interviewed candidates for MIT's new DEI VP. *MIT President Office*

2022-2024 **Advisor of MIT Student Advisory Group for Engineering (SAGE).** Provide Deans of Engineering with perspectives on education, engagement, & research, and organize . *MIT Dean's office*

2022-2024 **Advisor of MIT Student Advisory Group for EECS (USAGE).** Meet weekly with EECS department leadership to advise on academic matters and student experience; represented EECS at bi-annual visiting committee. *MIT EECS office*

2022-2024 **Undergrad Associative Advisor with Prof. Nancy Lynch ('22), Prof. Mina Lukovic ('23).** *MIT EECS office*

Outreach

2020-2023 **Director ('22-'23), Marketing Director ('21-'22) of MIT TechX.** Oversee and manage MIT's largest tech-related student org of 100+ organizers from 6 sub-orgs: ***HackMIT*** (MIT's largest hackathon), ***MakeMIT*** (MIT's largest makeathon), ***XFair*** (MIT's largest student-direct career fair), ***THINK*** (MIT's research outreach to high schoolers), ***ProjectX*** (MIT's student project fund), ***Blueprint*** (largest MIT hackathon for high schoolers). *MIT & National and International Outreach*

2020-2023 **Publicity Chair of MIT IEEE/ACM.** Connects MIT EECS and broader community of students, faculty, laboratories, and industrial companies through 50+ events; the first to initiate and build infrastructures for social media outreach. *MIT*

2018-now **Senior advisor ('20-present), Director ('18-'20) of TeenHacks LI (501(c)3 non-profit).** Grew a local event to the ***largest*** free 24-hour high school hackathon in Northeast, completely run by a team of 40 student organizers (15 organizers in '18); hosted over 1,000 students to-date (at unviersity venue in NYIT, LIU; remote during COVID) with fund raising over **$100k**. Team awarded as the ***Long Island Innovator of the Year*** and recognized by mainstream media such as ***Fox Business***, ***Newsdays***, ***Wall Street Journal***, as well as government officials *e.g.*, Congressman Suozzi, Nassau County Executive. *Long Island, NY & National and International Outreach*

2018-2020 **Admin, Planner & Instructor of United East Athletic Association (501(c)3 non-profit).** Organize the summer education program with 32 enrichment classes on STEM, literature, sports, cultural art appreciation, etc., with 550+ participants annually, with students from 5-14 years old and volunteers from various age groups. *Chinatown, NY*