

# Eva Yi Xie

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## Education

### Princeton University

PH.D. IN COGNITIVE QUANTITATIVE & COMPUTATIONAL NEUROSCIENCE

Princeton, NJ

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

B.S. IN MATHEMATICS AND IN ARTIFICIAL INTELLIGENCE & DECISION-MAKING (DOUBLE MAJORS)

Cambridge, MA

Sep 2020 - May 2024

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

## Research Experience

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

## 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 Orleans, 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. [\[paper\]](#)

**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. [\[paper\]](#)

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

Selected Awards, Fellowships, & Grants \_\_\_\_\_

2024-2029	<b>Centennial Fellowship</b> , Princeton University (1 of 3 fellows awarded in Neuroscience)	
	First year tuition & stipend (Centennial Fellowship)	-
	Premium stipend supplement (Centennial Fellowship)	+\$4,000/yr
2024	<b>MIT Dean of Science Fellowship</b> , 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	<b>D.E. Shaw Discovery Fellowship</b> , D.E. Shaw & Co. (1 of 37 recipients, 2 at MIT)	\$ 1,500
	<b>Excellence in Teaching &amp; Learning Award in Math</b> , MIT Math Department (1 of 4 awarded)	\$ 1,000
2020	<b>Bloomberg Grace Hopper Conference Scholar (Travel Grant)</b> , Bloomberg & National Center for Women and Information Technology (1 of 20 selected)	-
2020	<b>Minor Planet #17245 YiXie</b> , 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	<b>Top 40 Finalist at Regeneron Science Talent Search</b> , 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	<b>6.S191 Intro to Deep Learning</b> , Teaching Assistant <a href="#">[website]</a>	MIT EECS
Winter 23	<b>6.S191 Intro to Deep Learning</b> , Teaching Assistant <a href="#">[website]</a>	MIT EECS
Spring 22	<b>18.600 Probability &amp; Random Variables</b> , Teaching Assistant <a href="#">[website]</a>	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	<b>Mentor for PROJECT SHORT.</b> Shrink the socioeconomic gap in graduate school by mentoring underrepresented students on graduate school application and process.	
2023-2024	<b>Chair of MIT Judicial Review Board.</b> Oversee election & UA operation; rule on ambiguity and concerns regarding interpretation of constitution and governing documents.	MIT UG Association
2023-2024	<b>Cabinet Member of MIT Presidential Advisory Cabinet (PAC).</b> 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	<b>Advisor of MIT Student Advisory Group for Engineering (SAGE).</b> Provide Deans of Engineering with perspectives on education, engagement, & research, and organize .	MIT Dean's office
2022-2024	<b>Advisor of MIT Student Advisory Group for EECS (USAGE).</b> 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	<b>Undergrad Associative Advisor with Prof. Nancy Lynch ('22), Prof. Mina Lukovic ('23).</b>	MIT EECS office

### OUTREACH

2020-2023	<b>Director ('22-'23), Marketing Director ('21-'22) of MIT TechX.</b> Oversee and manage MIT's largest tech-related student org of 100+ organizers from 6 sub-orgs: <b>HackMIT</b> (MIT's largest hackathon), <b>MakeMIT</b> (MIT's largest makeathon), <b>XFair</b> (MIT's largest student-direct career fair), <b>THINK</b> (MIT's research outreach to high schoolers), <b>ProjectX</b> (MIT's student project fund), <b>Blueprint</b> (largest MIT hackathon for high schoolers).	MIT & National and International Outreach
2020-2023	<b>Publicity Chair of MIT IEEE/ACM.</b> 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	<b>Senior advisor ('20-present), Director ('18-'20) of TeenHacks LI (501(c)3 non-profit).</b> Grew a local event to the <b>largest</b> 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 university venue in NYIT, LIU; remote during COVID) with fund raising over <b>\$100k</b> . Team awarded as the <b>Long Island Innovator of the Year</b> and recognized by mainstream media such as <b>Fox Business, Newsdays, Wall Street Journal</b> , as well as government officials e.g., Congressman Suozzi, Nassau County Executive.	Long Island, NY & National and International Outreach
2018-2020	<b>Admin, Planner &amp; Instructor of United East Athletic Association (501(c)3 non-profit).</b> 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