Dongyan Lin

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Education

Doctor of Philosophy – Computational Neuroscience
Mila & McGill University, Montreal, Canada   Sep 2019 – Sep 2024
Advisor: Blake Richards
Honours Bachelors of Science – Physiology, Mathematics, Psychology
University of Toronto, Toronto, Canada   Sep 2015 – Jun 2019

Research Positions

Postdoctoral Researcher
FAIR at Meta, New York, USA   Dec 2024 – Present
Ph.D. Student
Mila, Montreal, Canada   Sep 2019 – Sep 2024
Visiting Researcher
Berkeley AI Research Lab, California, USA   Jun 2024 – Sep 2024
Neuro-AI Intern
Cold Spring Harbor Laboratory, New York, USA   Jun 2022 – Sep 2022
Lab Manager / Research Assistant
Department of Psychology, University of Toronto, Toronto, Canada   Sep 2018 – Apr 2019
Bioinformatics Intern
RIKEN Center for Integrative Medical Sciences, Yokohama, Japan   Jun 2018 – Aug 2018
Research Student
Sickkids Hospital, Toronto, Canada   May 2017 – Aug 2017

Awards & Honors

Michael Smith Foreign Study Supplement (for UC Berkeley)	$6,000 (2024)
Society for Neuroscience Trainee Professional Development Award	$1,000 (2022)
UNIQUE Centre Conference Travel Grant (for RLDM)	$1,000 (2022)
FRQNT Doctoral Scholarship (declined to take CGS-D)	$84,000 over 4 years (2022)
Alexander Graham Bell Canada Graduate Scholarship - Doctoral	$105,000 over 3 years (2022)
Healthy Brains, Healthy Lives PhD Fellowship	$15,000 over 1 year (2021)
IVADO MSc Excellence Scholarship	$40,000 over 2 years (2020)
Integrated Program in Neuroscience Recruitment Award	$5,000 (2019)
University of Toronto Dean's List	2019, 2018, 2017, 2016
Innis College Exceptional Achievement Award	$735 (2018)
University of Toronto Research Opportunity Program Award	$2,000 (2017)
Innis College Later Life Learning OSOTF Award	$1,336 (2017)

Innis College Later Life Learning OSOTF Award	$1,289 (2016)
University of Toronto Beatty Scholarship	$1,500 (2016)
University of Toronto Entrance Scholarship	$6,000 (2015)
Canada Governor General's Academic Bronze Medal	2015

Publications

G Google Scholar
*: Equal contribution
‡: mentee under my supervision

Papers

P8. A. GX-Chen, **D. Lin***, M. Samiei*, D. Precup, B. A. Richards, R. Fergus, K. Marino. Language Agents Mirror Human Causal Reasoning Biases. How Can We Help Them Think Like Scientists? *Conference on Language Modeling (CoLM)* (2025).

P7. A. GX-Chen*, **D. Lin***, M. Samiei*. Testing causal hypotheses through Hierarchical Reinforcement Learning. *NeurIPS 2024 Workshop on Intrinsically-Motivated and Open-Ended Learning* (2024).

P6. D. Lin. Fine-tuned network relies on generic representation to solve unseen cognitive task. *ICML 2024 Workshop on LLMs and Cognition* (2024).

P5. R. Tong, R. da Silva*, **D. Lin***, A. Ghosh*, J. Wilsenach, E. Cianfarano, P. Bashivan, B. A. Richards, S. Trenholm. The feature landscape of visual cortex. *bioRxiv* (2023).

P4. D. Lin, A. Z. Huang‡, B. A. Richards. Temporal encoding in deep reinforcement learning agents. *Scientific Reports* (2023).

P3. D. Lin, D. Levenstein, J. H. Cornford, A. Ghosh, D. L. Barack, J. W. Krakauer, T. A. Engel, J. C. R. Whittington. Neurons, circuits, or manifolds: reconciling the Sherringtonian and Hopfieldian views on neural computations. Generative Adversarial Collaborations (GAC) Proposal for 2023 Cognitive Computational Neuroscience (CCN) conference, Oxford, UK (2023).

P2. M. de Hoon, A. Bonetti, C. Plessy, Y. Ando, C-C. Hon, Y. Ishizu, M. Itoh, S. Kato, **D. Lin**, S. Maekawa, M. Murata, H. Nishiyori, J. W. Shin, J. Stolte, A. M. Suzuki, M. Tagami, H. Takahashi, S. Thongjuea, A. Forrest, Y. Hayashizaki, J. Kere, P. Carninci. Deep sequencing of short capped RNAs reveals novel families of noncoding RNAs. *Genome Research* (2022).

P1. D. Lin, B. A. Richards. Time cell encoding in deep reinforcement learning agents depends on mnemonic demands. *bioRxiv* (2021).

Conference Proceedings & Posters

C8. D. Lin, A. Z. Huang‡, B. A. Richards. Time cells contribute to working memory through value-based recurrent dynamics. *Computational and Systems Neuroscience (COSYNE)*, *Lisbon*, *Portugal. February 2024*. [Link to poster]

C7. R. Tong, A. Ghosh, E. Cianfarano, B. A. Richards, R. da Silva, **D. Lin**, J. Wilsenach, P. Bashivan, S. Trenholm. The feature landscape of visual cortex. *Computational and Systems Neuroscience (COSYNE)*, *Lisbon*, *Portugal. February 2024*.

C6. D. Lin, R. da Silva, A. Ghosh, R. Tong, S. Trenholm, B. A. Richards. Neuronal optimal stimuli synthesized with deep learning reveal functional segregations in the mouse visual cortex. *Society for Neuroscience (SfN)*, *San Diego, CA, USA. November 2022*. [Link to poster]

C5. A. Z. Huang‡, **D. Lin**, B. A. Richards. Time cell encoding is decoupled from time perception in deep reinforcement learning agents. *Cognitive Computational Neuroscience (CCN)*, *San Francisco, CA, USA. August 2022*. **Selected as a Contributed Talk (<5% of submissions)**. [Link to abstract] [Link to presentation]

C4. D. Lin, A. Z. Huang‡, B. A. Richards. Heterogeneous Representations of Variables in Task-Optimized DRL Agents Depend on Task-Relevance. *The Multidisciplinary Conference on Reinforcement Learning and Decision Making (RLDM)*, *Providence, RI, USA. June 2022*. [Link to paper]

C3. D. Lin, B. A. Richards. Time cell encoding in deep reinforcement learning agents depends on mnemonic demands. *Computational and Systems Neuroscience (COSYNE)*, *Lisbon, Portugal. March 2022*. [Link to poster]

C2. D. Lin, FANTOM Consortium, M. de Hoon. Elucidating the functional roles of anti-sense transcripts in human THP-1 leukemia cells with computational methods. *Summer Undergraduate Research Symposium*, *Department of Cell & System Biology, University of Toronto. September 2018*. **Received the Best Poster Award.** [Link to poster]

C1. D. Lin, S. Ratté, S. A. Prescott. The chloride regulation of mouse hippocampal gamma oscillation in vitro. *University Research Opportunity Program Awardee Seminar*, *University of Toronto. July 2017*. [Link to presentation]

Teaching

Teaching Assistant – Machine Learning	
IBRO-Simons Computational Neuroscience Imbizo, Cape Town, South Africa	2023, 2025
Teaching Assistant: INF8953DE (Reinforcement Learning)	
Polytechnique Montréal, Montreal, Canada	Fall 2021
Teaching Assistant / Project Manager	
AI4Good Lab, Montreal, Canada	Summer 2021
Classroom Instructor	
BrainReach, Montreal, Canada	Fall 2020, Winter 2021
Teaching Assistant: MAT135 (Calculus I), MAT136 (Calculus II)	
University of Toronto, Toronto, Canada	Fall 2018, Winter 2019
Classroom Instructor	
Easy Group Inc., Toronto, Canada	Sep 2016 – Apr 2018

Service

Trainee Representative	
HBHL Equity, Diversity, and Inclusion Committee, Montreal, Canada	Sep 2021 – Sep 2022
Mental Health First Aider	
Mila, Montreal, Canada	Feb 2021 – Sep 2024
Lab Representative	
Mila, Montreal, Canada	Nov 2021 – Nov 2022
Organizer	
Montréal AI & Neuroscience (MAIN) Conference, Montreal, Canada	Oct 2020 – Nov 2020
Organizer	
UNIQUE Student Symposium, Montreal, Canada	Feb 2020 – May 2020
Peer Mentor	
First-year Learning Community, University of Toronto, Toronto, Canada	May 2018 – Apr 2019

Event Leader

Centre for International Experience, University of Toronto, Toronto, Canada   May 2018 – Apr 2019

Mentor

Centre for International Experience, University of Toronto, Toronto, Canada   May 2017 – Apr 2018

Paper Reviewing

NeurIPS 2021, 2022 AI4Science Workshop, ICML 2022 AI4Science Workshop, ICLR 2023

Last updated: August 16, 2025