

# Thomas Jiralerspong

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Université de Montréal  
Mila  
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## Education

### Université de Montréal

PhD - Computer Science

*In progress*

Supervisors: [Yoshua Bengio](#) & [Doina Precup](#)

FRQNT Master's Scholarship (40 000\$) (Rank #1 among all applicants in category)

NSERC Canada Graduate Scholarship (17 500\$)

Hydro-Québec Excellence Scholarship (10 000\$)

Arbour Scholarship (7 500\$)

### Massachusetts Institute of Technology

Brains, Minds, and Machines Summer Course

*2024*

### McGill University

B.Sc., Honours Computer Science

*2023*

Supervisors: [Blake Richards](#) & [Doina Precup](#)

GPA: 4.00/4.00

Exchange semester at the **National University of Singapore**

J.W. McConnell Major Entrance Scholarship (9 000\$)

## Refereed Conferences

Ezekiel Williams\*, Avery Ryoo\*, **Thomas Jiralerspong\***, Matt Perich, Guillaume Lajoie.  
“The Expressivity of Random Neural Networks with Learned Inputs.” Accepted to *The Conference on Cognitive Computational Neuroscience (CCN)*. 2024.

Jean-Pierre Falet, Hae Beom Lee, Nikolay Malkin, Chen Sun, Dragos Secrieru, **Thomas Jiralerspong**, Dinghuai Zhang, Guillaume Lajoie, Yoshua Bengio. “Delta-AI: Local Objectives for Amortized Inference in Sparse Graphical Models” In *Twelfth International Conference on Learning Representations (ICLR)*. 2024.

Chen Sun, Wannan Yang, **Thomas Jiralerspong**, Dane Malenfant, Benjamin Alsbury-Nealy, Yoshua Bengio, Blake Richards. “Contrastive Retrospection: honing in on critical steps for rapid learning and generalization in RL.” In *Thirty-seventh Annual Conference on Neural Information Processing Systems (NeurIPS)*. 2023.

Flemming Kondrup\*, **Thomas Jiralerspong\***, Elaine Lau, Nathan de Lara, Jacob Shkrob, My Duc Tran, Doina Precup, Sumana Basu. “Towards Safe Mechanical Ventilation Treatment Using Deep Offline Reinforcement Learning.” In *Thirty-seventh AAAI Conference on Artificial Intelligence (AAAI)*. 2023.

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\* Equal Contribution

Marshall Wang, John Willes, **Thomas Jiralerspong**, Matin Moezzi. “A Comparison of Classical and Deep Reinforcement Learning Methods for HVAC Control.” In *20th IEEE International Conference on Ubiquitous Intelligence and Computing (UIC)*. 2023.

## Refereed Workshops

**Thomas Jiralerspong\***, Xiaoyin Chen\*, Yash More, Vedant Shah, Yoshua Bengio. “Efficient Causal Graph Discovery Using Large Language Models.” In *How Far Are We From AGI? Workshop at ICLR*. 2024.

**Thomas Jiralerspong\***, Flemming Kondrup\*, Doina Precup, Khimya Khetarpal. “Forecaster: Towards Temporally Abstract Tree-Search Planning from Pixels.” In *Seventh Workshop on Generalization in Planning at NeurIPS*. 2023.

Flemming Kondrup\*, **Thomas Jiralerspong\***, Elaine Lau, Nathan de Lara, Jacob Shkrob, My Duc Tran, Doina Precup, Sumana Basu. “Deep Conservative Reinforcement Learning for Personalization of Mechanical Ventilation Treatment.” In *The Multi-disciplinary Conference on Reinforcement Learning and Decision Making (RLDM)*. 2022.

## Under Review

Eric Elmoznino\*, **Thomas Jiralerspong\***, Yoshua Bengio, Guillaume Lajoie. “Towards A Formal Theory of Compositionality” Under review at *The Thirteenth International Conference on Learning Representations (ICLR)*. 2025.

Jin Hwa Lee\*, **Thomas Jiralerspong\***, Lei Yu, Emily Cheng. “Geometric Signatures of Compositionality Across a Language Model’s Lifetime” Under review at *The Thirteenth International Conference on Learning Representations (ICLR)*. 2025.

Ezekiel Williams, Avery Hee-Woon Ryoo\*, **Thomas Jiralerspong\***, Alexandre Payeur, Matthew G Perich, Luca Mazzucato, Guillaume Lajoie. “Expressivity of Neural Networks with Random Weights and Learned Biases.” Under review at *The Thirteenth International Conference on Learning Representations (ICLR)*. 2025.

Marco Jiralerspong, Thomas Jiralerspong, Vedant Shah, Dhanya Sridhar, Gauthier Gidel. “General Causal Imputation via Synthetic Interventions.” Under review at *The Causal Representation Learning Workshop at NeurIPS*. 2024.

## Research Experience

### **Occam AI**

*LLM Research Intern*

*Jun 2024 - Present*

**Project:** Automated SQL query generation using LLMs

### **Waabi**

*Deep Learning Research Intern*

*Jun 2023 – Aug 2023*

*Mentored by Kelvin Wong and Chris Zhang*

**Project:** Realistic and controllable traffic simulation using a transformer based variational autoencoder

### **Reasoning and Learning Lab, Mila/McGill University**

*Research Intern*

*Jan 2022 – Aug 2023*

*Supervised by Prof. Doina Precup*

**Project:** Model-based reinforcement learning with affordance aware tree-search planning directly from pixels

	<b>Learning in Neural Circuits Lab, Mila/McGill University</b> <i>Research Intern</i> <span style="float: right;"><i>Sep 2022 – Aug 2023</i></span> <i>Supervised by Prof. Blake Richards</i> <b>Project:</b> Contrastive learning to discover critical states for reinforcement learning in sparse reward environments
	<b>Vector Institute for A.I.</b> <i>Machine Learning Research Intern</i> <span style="float: right;"><i>Sep 2022 – Dec 2022</i></span> <i>Mentored by John Willes and Marshall Wang</i> <b>Project:</b> Model-based reinforcement learning for HVAC control
	<b>Project X, Machine Learning Research Competition</b> <i>Co-leader of McGill's Team</i> <span style="float: right;"><i>Jun 2021 – Feb 2022</i></span> <i>Received the highest score out of 25 submitted papers</i> <b>Project:</b> Deep offline conservative reinforcement learning for mechanical ventilation treatment
Industry Experience	<b>Amazon Web Services (AWS) – S3 Team</b> <i>Software Development Engineer Intern</i> <span style="float: right;"><i>May 2022 – Jul 2022</i></span> <b>Project:</b> JavaScript/Python tool to automate the Incremental Backup recovery system for AWS S3 (stores ~14 trillion objects)
	<b>Square Enix</b> <i>Software Development Intern</i> <span style="float: right;"><i>May 2021 – Aug 2021</i></span> <b>Project:</b> Localization system to allow a MOBA game to be translated into over 10 languages
	<b>Expedia</b> <i>Software Development Intern</i> <span style="float: right;"><i>May 2021 – Aug 2021</i></span> <b>Project:</b> React/TypeScript tool to identify which elements of a webpage are broken and conveniently display them to developers
Teaching	<b>Université de Montréal</b> Teaching Assistant, Representation Learning <span style="float: right;">2023</span>
	<b>McGill A.I. Society</b> Organizer/Teaching Assistant, Accelerated Intro to ML <span style="float: right;">2021 – 2023</span>
	<b>McGill University</b> Teaching Assistant, Software Systems <span style="float: right;">2021 – 2022</span> Guest Lecturer, Theory of Machine Learning <span style="float: right;">2022</span>
Honors	FRQNT Master's Scholarship (40000\$) (Rank #1 among all applicants in category) 2024
	Arbour Scholarship (7500\$) <span style="float: right;">2024</span>
	Hydro-Québec Excellence Scholarship (10000\$) <span style="float: right;">2024</span>
	Chosen to attend the 10th Heidelberg Laureate Forum <span style="float: right;">2023</span>

	NSERC Canada Graduate Scholarship (17500\$)	2023
	University of Montreal Master's Scholarship (5000\$)	2023
	McGill Mobility Bursary for Exchanges (6000\$)	2022
	Winner of UofT AI's Project X competition (25000\$)	2022
	J.W. McConnell Major Entrance Scholarship (9000\$)	2020 – 2022
	CIBPA Foundation Bursary (1000\$, 2500\$, 1000\$)	2021, 2022, 2023
	Marianopolis College Valedictorian	2020
	Governor General of Canada's Academic Medal	2020
Invited Talks	Canadian Undergraduate Conference on AI (CUCAI)	2022
	University of Toronto AI Conference	2022
	McGill AI Society Learnathon	2022
Professional Activities	<b>Mila</b>	
	Chairman of Lab Representatives	2023 – Present
	Chairman of Social Committee	2023 – Present
	Executive Member of Recruitment Committee	2023 – Present
	<b>McGill AI Society</b>	
	Senior Advisor	2023 – Present
	Technical Project Manager	2021 – 2023
	<b>Montreal AI &amp; Neuroscience Conference</b>	
	Organizer – Introduction to deep learning with PyTorch workshop	2022
	<b>McGill NeuroTech</b>	
	Machine Learning Developer	2021 – 2022
	<b>McGill Robotics</b>	
	Software Developer	2020 – 2021
	<b>Languages</b>	
	<b>Native:</b> English, French	
	<b>Advanced:</b> Italian, Spanish	
	<b>Beginner:</b> Mandarin, Japanese	
Skills	<b>Programming Languages:</b> Python, Java, JavaScript, R, C, C++, C#, OCaml, SQL, HTML, CSS	
	<b>Machine Learning Libraries:</b> PyTorch, TensorFlow, Keras, Pandas, NumPy, Matplotlib	
	<b>Other:</b> L <sup>A</sup> T <sub>E</sub> X, Slurm, Jupyter Notebooks, Perforce, GitHub, Jira, Unity	
Press	<b>SciLogs.</b> Nina Beier. Jan 24, 2024. <a href="#">What Do Food and Research Have in Common? More Than You Might Think.</a>	

**The McGill Tribune.** Mikaela Shadick. March 15, 2022. [Six McGill undergrads win UofT international artificial intelligence competition.](#)

**McGill Reporter.** Richard Deschamps. March 1, 2022. [Undergrad team uses machine learning to create a better hospital ventilator.](#)

## Advanced Coursework

### **Université de Montréal**

Representation Learning  
Reinforcement Learning & Optimal Control  
Scaling Laws  
Causal Inference & Machine Learning  
Probabilistic Graphical Models

### **McGill University**

Reinforcement Learning  
Brain Inspired Artificial Intelligence  
Honours Math for Machine Learning  
Probabilistic Programming  
Network Science

### **National University of Singapore**

Quantum Computing  
Information Theory