Thomas Jiralerspong

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Education

Université de Montréal
M.Sc., Computer Science *(Expected) 2025*
Supervisors: Yoshua Bengio & Doina Precup

McGill University
B.Sc., Honours Computer Science *2023*
GPA: 4.00/4.00
Supervisors: Blake Richards & Doina Precup
Exchange semester at the National University of Singapore

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*. 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.

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.

* Equal Contribution

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.

Preprints

Yu Lu Liu*, **Thomas Jiralerspong***. "Network Analysis of the iNaturalist Citizen Science Community." arXiv preprint arXiv:2310.10693.

Research Experience

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

Learning in Neural Circuits Lab, Mila/McGill University
Research Intern *Sep 2022 – Aug 2023*
Supervised by Prof. Blake Richards
Project: Contrastive learning to discover critical states for reinforcement learning in sparse reward environments

Vector Institute for A.I.
Machine Learning Research Intern *Sep 2022 – Dec 2022*
Mentored by John Willes and Marshall Wang
Project: Model-based reinforcement learning for HVAC control

Project X, Machine Learning Research Competition
Co-leader of McGill's Team *Jun 2021 – Feb 2022*
Received the highest score out of 25 submitted papers
Project: Deep offline conservative reinforcement learning for mechanical ventilation treatment

Industry Experience

Amazon Web Services (AWS) – S3 Team
Software Development Engineer Intern *May 2022 – Jul 2022*
Project: JavaScript/Python tool to automate the Incremental Backup recovery system for AWS S3 (stores ∼14 trillion objects)

Square Enix
Software Development Intern *May 2021 – Aug 2021*
Project: Localization system to allow a MOBA game to be translated into over 10 languages

Expedia
Software Development Intern *May 2021 – Aug 2021*
Project: React/TypeScript tool to identify which elements of a webpage are broken and conveniently display them to developers

Teaching

Université de Montréal
Teaching Assistant, Representation Learning 2023

McGill A.I. Society
Organizer/Teaching Assistant, Accelerated Intro to ML 2021 – 2023

McGill University
Teaching Assistant, Software Systems 2021 – 2022
Guest Lecturer, Theory of Machine Learning 2022

Honors

FRQNT Master's Scholarship (20000$) (Rank #1 among all applicants) 2024
Chosen to attend the 10th Heidelberg Laureate Forum 2023
NSERC Canada Graduate Scholarship (17500$) 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

Mila
Chairman of Lab Representatives 2023 – Present
Student Representative on Recruitment Committee 2023 – Present
Student Representative on Social Committee 2023 – Present

McGill AI Society
Senior Advisor 2023 – Present
Technical Project Manager 2021 – 2023

Montreal AI & Neuroscience Conference
Organizer – Introduction to deep learning with PyTorch workshop 2022

McGill NeuroTech
Machine Learning Developer 2021 – 2022

McGill Robotics
Software Developer 2020 – 2021

Languages

Native: English, French
Advanced: Italian, Spanish
Beginner: Mandarin, Japanese

Skills

Programming Languages: Python, Java, JavaScript, R, C, C++, C#, OCaml, SQL, HTML, CSS

Machine Learning Libraries: PyTorch, TensorFlow, Keras, Pandas, NumPy, Matplotlib

Other: LaTeX, Slurm, Jupyter Notebooks, Perforce, GitHub, Jira, Unity

Press

SciLogs. Nina Beier. Jan 24, 2024. What Do Food and Research Have in Common? More Than You Might Think.

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