

# Thomas Jiralerspong

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## Education

### McGill University

Bachelor of Science - Honours Computer Science

Sep 2020 – Apr 2023

- **GPA: 4.0/4.0**
- **Relevant Coursework:** Representation Learning, Reinforcement Learning, Brain Inspired AI., Network Science, Math for ML, Probabilistic Programming

## Technical Skills

**Programming:** Python, Keras, PyTorch, NumPy, Pandas, d3rlpy, SQL, Java, C#, C++, OCaml, C, Bash, R, JavaScript, HTML, CSS

**Other:** Jupyter Notebooks, Slurm, Perforce, GitHub, Jira, Unix, Linux, Unity

## Research Experience

### Mila/McGill University – Supervised by Prof. Blake Richards

Undergraduate Researcher – Montreal, Quebec

Sep 2022 – Present

**Ongoing paper:** *Contrastive Introspection (ConSpec) to Rapidly Identify Invariant Steps for Success*

- Adapted ConSpec to work on MuJoCo, developed a sparsified version of MuJoCo, demonstrated ConSpec's superiority on these environments

### Mila/McGill University – Supervised by Prof. Doina Precup

Undergraduate Researcher – Montreal, Quebec

Jan 2022 – Present

**Ongoing project:** Deep reinforcement learning with temporally extended models and affordance-aware tree-search planning

- Developed the initial research proposal, implemented our algorithm, currently comparing our algorithm to baselines on a variety of environments

### Vector Institute for Artificial Intelligence

Machine Learning Research Intern – Toronto, Ontario

Sep 2022 – Dec 2022

**Project:** Reinforcement learning system for energy efficient data center HVAC control

- Transformed the model-based [Hyperspace Neighbor Penetration](#) algorithm into a model-free algorithm that is compatible with an existing simulator

### Project X – Machine Learning Research Competition

Co-Leader of McGill's Team

Jun 2021 – Feb 2022

**Paper:** *Towards Safe Mechanical Ventilation Treatment Using Deep Offline Reinforcement Learning (co-first author) (LAAI 2023)*

- Developed the research proposal, preprocessed data from over 50 000 patients, implemented the training pipeline, trained policies to get the final results

### McGill University – Supervised by Prof. Christian Genest

Collegiate Researcher – Montreal, Quebec

Jan 2020 – May 2020

**Paper:** *Modelling the Evolution of Arctic Ice Extent using ARIMA models in R (co-first author)*

## Professional Experience

### Amazon Web Services (AWS) – S3 Team

Software Development Engineer Intern – Vancouver, British Columbia

May 2022 – Jul 2022

- Developed a **JavaScript/Python** tool to automate the Incremental Backup recovery system for AWS S3 (reduced recovery time by 5h/week)

### Square Enix

Software Development Intern – Montreal, Quebec

May 2021 – Aug 2021

- Designed and implemented a localization system using **Unity/C#** to allow a MOBA game to be translated into over **10 languages**

### Expedia Group

Software Development Intern – Montreal, Quebec

Jun 2019 – Aug 2019

- Developed a **React/TypeScript** tool to identify which elements of a webpage are broken and conveniently display them to developers

## Publications

### [Towards Safe Mechanical Ventilation Treatment Using Deep Offline Reinforcement Learning](#)

F. Kondrup\*, [T. Jiralerspong\\*](#), E. Lau\*, N. de Lara, J. Shkrob, M.D. Tran, D. Precup, S. Basu

IAAI, 2023

### [Contrastive Introspection \(ConSpec\) to Rapidly Identify Invariant Prototypes for Success in RL](#)

C. Sun, W. Yang, B. Alsbury-Nealy, [T. Jiralerspong](#), Y. Bengio, B. Richards

Submitted to ICML, 2023

### [Network Analysis of the iNaturalist Citizen Science Community](#)

Y. Liu\* & [T. Jiralerspong\\*](#)

Preprint, 2022

### [Modelling the Evolution of Arctic Sea Ice Extent](#)

X. Fan\*, [T. Jiralerspong\\*](#), K. Zhu\*, B. Nasri, C. Genest

Preprint, 2020

\*Equal Contribution

## Projects

### [Rainbow Q-Learning in Jelly-Bean World](#)

2022

### [Generating Music Using a LSTM Network with Attention](#)

2020