

Clare Lyle

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INTERESTS

Reinforcement learning, generalization, invariance in deep learning

EDUCATION

University of Oxford DPhil in Computer Science

Started October 2018 | Oxford, UK

McGill University B.Sc. in Mathematics and Computer Science

Joint Honours in Mathematics and Computer Science | May 2018 | Montreal, QC | Cum. GPA 3.99/4.0

PUBLICATIONS & PREPRINTS

Self-Attention Between Datapoints: Going Beyond Individual Input-Output Pairs in Deep Learning

Jannik Kossen, Neil Band, Clare Lyle, Aidan Gomez, Tom Rainforth, Yarín Gal. NeurIPS 2021.

Revisiting the train loss: an efficient performance estimator for neural architecture search

Binxin Ru, Clare Lyle, Lisa Schut, Mark van der Wilk, Yarín Gal. NeurIPS 2021.

Resolving Causal Confusion in Reinforcement Learning via Robust Exploration

Clare Lyle, Amy Zhang, Minqi Jiang, Joelle Pineau, Yarín Gal. Self-Supervision for Reinforcement Learning Workshop at ICLR 2021.

Provable Guarantees on the Robustness of Decision Rules to Causal Interventions.

Benjie Wang, Clare Lyle, Marta Kwiatkowska. IJCAI 2021.

PsiPhi-Learning: Reinforcement Learning with Demonstrations using Successor Features and Inverse Temporal Difference Learning.

Angelos Filos, Clare Lyle, Yarín Gal, Sergey Levine, Natalie Jaques, Gregory Farquhar. ICML 2021.

On The Effect of Auxiliary Tasks on Representation Dynamics.

Clare Lyle, Mark Rowland, Georg Ostrovski, Will Dabney. AISTATS 2021.

A Bayesian Perspective on Training Speed and Model Selection.

Clare Lyle, Lisa Schut, Binxin Ru, Yarín Gal, Mark van der Wilk. NeurIPS 2020.

Invariant Causal Prediction for Block MDPs.

Amy Zhang, Clare Lyle, Shagun Sodhani, Angelos Filos, Marta Kwiatkowska, Joelle Pineau, Yarín Gal, Doina Precup. ICML 2020.

An Analysis of the Effect of Invariance on Generalization in Neural Networks.

Clare Lyle, Marta Kwiatkowska, Yarín Gal. ICML 2019 Workshop on Understanding and Improving Generalization in Deep Learning.

A Geometric Perspective on Optimal Representations in Reinforcement Learning.

Marc G. Bellemare, Will Dabney, Robert Dadashi, Adrien Ali Taïga, Pablo Samuel Castro, Nicolas Le Roux, Dale Schuurmans, Tor Lattimore, Clare Lyle, NeurIPS 2019.

A Comparative Analysis of Expected and Distributional Reinforcement Learning.

Clare Lyle, Pablo Samuel Castro, Marc G. Bellemare. Proceedings of the Thirty-First AAAI Conference, 2019.

The Malicious Use of Artificial Intelligence: Forecasting, Prevention, and Mitigation

Miles Brundage, Shahar Avin, Jack Clark, ..., Clare Lyle, ..., Dario Amodei

AWARDS

Open Philanthropy AI Fellow Open Philanthropy Foundation

2020

The Open Phil AI Fellowship is a fellowship for full-time PhD students focused on artificial intelligence or machine learning. Fellows receive a \$40,000 stipend, \$10,000 in research support, and payment of tuition and fees, each year, starting in the year of their selection until the end of the 5th year of their PhD.

Interact Fellow Interact Fellowship

2019

Interact is a community of mission-driven technologists. Recipients of the fellowship participate in a community retreat each year.

Dr Feng Qian Convocation Prize School of Computer Science, McGill University

2018

Edward Rosenthal Memorial Prize in Mathematics Department of Mathematics, McGill University

2018

Rhodes Scholar Rhodes Trust, University of Oxford

2017

The Rhodes Scholarship is a postgraduate award supporting exceptional students from around the world to study at the University of Oxford.

Sir Edward Beatty Memorial Prize in Mathematics Department of Mathematics, McGill University

2017

Awarded in recognition of high academic merit to students entering the intermediate or final year in Major or Honours Mathematics. Awarded on the recommendation of the Department of Mathematics

Dr Feng Qian Scholarship School of Computer Science, McGill University

2017

For three or more outstanding undergraduate students enrolled in the School of Computer Science. Awarded by the Faculty of Science in consultation with the School of Computer Science on the basis of academic merit.

McGill Dean's List Faculty of Science, McGill University

2015-2018

Awarded to top 10% of faculty on basis of GPA

Dorothy Xanthaky Osborne Award Faculty of Science, McGill University

2016

Awarded on the basis of distinguished academic standing to students who have completed at least one year of an undergraduate program in the Faculty of Science. Awarded by the Faculty of Science Scholarships Committee.

Loran Award Loran Scholars Foundation

2014

One of 30 students from 3,500 applicants chosen on the basis of service, character and leadership to receive a four year scholarship (\$100K) including mentorship and leadership development.

Governor General's Bronze Medal Government of Canada

2014

Given to student with highest graduating average in their academic institution.

BC Provincial Examinations Scholarships Government of British Columbia

2014

The Graduation Program Examinations Scholarship recognizes academic achievement in provincial examinations. These scholarships are capped at 20 (\$2500) awards to the top students in the province based on their exam percentage scores.

EXPERIENCE

DeepMind | Research Scientist Intern

March 2021-July 2021 | Virtual London, UK

- Conducted research on reinforcement learning.
- Work from this internship currently in preparation for submission.

Google Brain | Software Developer Intern

May 2018-August 2018 | Montreal, Canada

- Conducted research on distributional reinforcement learning and representation learning.
- Presented research at AAAI 2019 and at an ICML 2018 workshop.

Future of Humanity Institute, University of Oxford | AI Policy Intern

May 2017 – July 2017 | Oxford, UK

- Contributed to technical reports produced by the institute
- Worked with a team to develop and distribute a survey on public perceptions of AI

Microsoft | Explore Intern

May 2016-August 2016 | Redmond, WA

- Trained and deployed a machine learning model for an internal tool to classify customer feedback text.

McGill Tribune | Web Editor

2016-2017, Staff Writer 2014-2016

- Implemented website redesign, back-end server optimization, provided technical support for web content to section editors
- As staff writer, contributed articles on a minimum biweekly basis

TEACHING

Trinity College, University of Oxford College Lecturer

- Linear Algebra, Discrete Maths, Continuous Maths. Michaelmas 2021-Hilary 2022
- Assist with student assessment and admissions.

Worcester College, University of Oxford Visiting Student Program Tutor

- Linear Algebra II, Michaelmas 2019
- Linear Algebra I, Hilary 2020

Department of Mathematics, University of Oxford Teaching assistant

- Set Theory, Hilary 2019

McGill University Undergraduate Teaching Assistant

- Fall 2017: MATH 350 - Graph Theory and Combinatorics

McGill University TEAM Mentor

Winter 2016, Winter 2017

Supported by funding from an undergraduate teaching and mentorship award for COMP 202, McGill's Foundations of Programming course. Held office hours and ran tutorials for students in the course.

McGill University Tutor

2016-2018

Tutored at free drop-in help desks run by the university

- Fall 2016-2018: Computer Science Undergraduate Society Help Desk
- Fall 2017-2018: Department of Mathematics Help Desk

INVITED TALKS

- July 2020. **Qualcomm, Invited Speaker Talks.**
- October 2020. **Simons Institute Workshop on the Theory of Deep Reinforcement Learning.**
- October 2021 **Generative Models and Uncertainty Quantification Workshop**

OTHER ACTIVITIES

Oxford University Basketball Club | Player, Club IT Officer

Oct. 2018-present

- Played on the women's first team and ran the club website from 2019-2021.

University College Middle Common Room | Secretary

April 2020-21

- Kept minutes at council meetings and maintained the council website. Added an online calendar for organizing events during Freshers' week. Participated in meetings with the College's Bronze team to address student welfare during the COVID-19 pandemic.

Rhodes AI Lab | Co-Director

Sept. 2019-20

- Organized talks and public engagement events ranging from an "introduction to AI" talk to invited speakers such as Andrew Trask of OpenMined. Assisted in the organization of the year's project cycle.

HackMcGill | President

Sept. 2016-2018, Logistics Director Jan. 2015-Sept. 2016

- Organized events and resources to promote a collaborative programming culture at McGill, including a 700-person hackathon in the Winter semester

Computer Science Undergraduate Society | VP Academic

May 2017 - present, Math/CS Rep May 2016-May 2017

- Represented student interests in departmental faculty meetings, developed and updated academic resources on the undergraduate society website, developed an independent study course in computer science, provided student feedback on departmental curriculum changes, and organized tutorials.
- As math/cs rep, wrote the joint major program's first academic guide

World University Service of Canada- McGill | Co-chair

2015-2016

- Coordinated the Student Refugee Program, a program that provides refugees graduating from high school in regions with limited access to post-secondary education with the opportunity to attend Canadian universities