

ALEXANDRA KEARNEY

11641 73rd AVE NW, Edmonton, Alberta, T6G0E3 | hi@alexkearney.com | (780)-655-4958

EDUCATION | **PhD COMPUTER SCIENCE**, Advisors: Prof. Rich Sutton & Prof. Patrick Pilarski
University of Alberta, (Expected 2021)

BSc ARTIFICIAL INTELLIGENCE AND COMPUTER SCIENCE, First Class with Honors
University of Edinburgh, 2016

EXPERIENCE | **RESEARCH ASSISTANT**, Reinforcement Learning & Artificial Intelligence Lab
(2016-present) University of Alberta | Supervisors: Patrick Pilarski PhD, Rich Sutton PhD.

- Generalized step-size adaptation method for use with Temporal-difference Learning; improved performance over ordinary fixed step-size TD learning.
- Demonstrated efficacy of method to perform representation learning by biasing weight updates based on relevance of features.

MACHINE LEARNING RESEARCH INTERN, Borealis Research Institute
(Summer 2017)

- Improved stability of step-size adaptation method, making it robust to initializations of parameter settings across different prediction problems.

RESEARCH INTERN, Reinforcement Learning & Artificial Intelligence Lab
(2015) University of Alberta | Supervisors: Patrick Pilarski PhD, Rich Sutton PhD.

- Evaluated robustness of on-policy TD prediction methods on a robot platform.
- Performed comparison of step-size adaptation methods for Temporal-difference learning on a variety of synthetic and real-world problems.

RESEARCH INTERN, Rehabilitation Robotics Lab
(2013/2014) University of Alberta | Supervisors: Patrick Pilarski PhD, Rich Sutton PhD.

- Developed software for myoelectric control of a bionic third-limb.
- Collected and evaluated data to assess a novel meta-learning algorithm.
- Authored a workshop paper; presented results orally at an international workshop.
- Created a machine learning experiment framework for the Robot Operating System, enabling graduate students to test algorithms on real-world domains.
- Collaborated on system to predict user's intent when controlling a bionic limb.

HACKATHON COORDINATOR, University of Edinburgh
(2014) | University of Edinburgh

- Coordinated a week-long hackathon at U of E for over 80 students.
- Gathered sponsors to finance the event, recruited volunteers from industry and government, promoted the event to students.

PUBLICATIONS | **A. Kearney**, A. Koop, C. Sherstan, J. Günther, R.S. Sutton, P.M. Pilarski, M.E. Taylor, "Evaluating Predictive Knowledge," Accepted to *AAAI Fall Symposium on Reasoning and Learning In Real-World Systems For Long-Term Autonomy*, Arlington, VA, U.S.A.

J. Günther, **A. Kearney**, M.R. Dawson, C. Sherstan, P.M. Pilarski, "Predictions, Surprise, and Predictions of Surprise in General Value Function Architectures," Accepted to *AAAI Fall Symposium on Reasoning and Learning In Real-World Systems For Long-Term Autonomy*, Arlington, VA, U.S.A.

A.J. Koop, **A. Kearney**, M. Bowling, P.M. Pilarski, "Dealing With Changing Contexts In Myoelectric Control," *Proc. Of Mec'14: Myoelectric Controls Symposium*, Fredericton, New Brunswick, August 18-22, 2014, Pp. 117-120.

EXTENDED ABSTRACTS, ABSTRACTS, & PRESENTATIONS | **A. Kearney**, R.S. Sutton, P.M. Pilarski, "An Enactive Approach to Perception in Reinforcement Learning", *CAPNet/CPS CAN-ACN Satellite Symposium*, Co-located with Canadian Association for Neuroscience Conference, Vancouver, British Columbia, Canada, 2018. (Accepted; Oral Presentation and Abstract)

A. Kearney, V. Veeriah, J. Travník, R.S. Sutton, P.M. Pilarski, "Every Step You Take: Vectorized Adaptive Step-Sizes For Temporal-Difference Learning," *3rd Multidisciplinary Conference on Reinforcement Learning and Decision Making (RLDM)*, Ann Arbor, Michigan, USA, 2017, 5 pages.

A. Kearney, A. Koop, M. Bowling, P.M. Pilarski, "Partition Tree Learning for Improved Control of Myoelectric Prosthetics," *8th Annual Workshop for Women in Machine Learning*, Co-located with NIPS, Lake Tahoe, Nevada, Dec. 05, 2013. (Oral and poster presentation.)

TECHNICAL REPORTS & NON-REFEREED CONTRIBUTIONS | **A. Kearney**, V. Veeriah, J. B. Travník, R. S. Sutton, P. M. Pilarski, "TIDBD: Adapting Temporal-difference Step-sizes Through Stochastic Meta-descent," arXiv:1804.03334 [cs.LG] (arXiv): 9 pages, 2018 (v1 from May 19, 2017).

HONOURS & AWARDS | **NSERC POSTGRADUATE SCHOLARSHIPS-DOCTORAL**
(2018) | NSERC | \$63 000

PRESIDENT'S DOCTORAL PRIZE OF DISTINCTION
(2018) | UofA | \$63 000

SCIENCE GRADUATE SCHOLARSHIP
(2017) | UofA

WALTER H. JOHNS GRADUATE FELLOWSHIP
(2017) | UofA

CANADA GRADUATE SCHOLARSHIPS – MASTER'S PROGRAM
(2017) | NSERC

Awarded to 2500 students in Canada who show academic, research, and leadership potential.

ANITA BORG MEMORIAL SCHOLARSHIP - EMEA
(2014) | Google

A scholarship for 40 post-secondary students in Computer Science in Europe, the Middle East, and Africa. Awarded based on the strength of each candidate's academic

background, passion for increasing the involvement of women in computer science, and demonstrated leadership.

PEOPLES' CHOICE POSTER

(2013) | British Computing Society: Lovelace Colloquium

TRAVEL AWARDS & SCHOOLS

DEEP LEARNING & REINFORCEMENT LEARNING SUMMER SCHOOL

CIFAR | Toronto 2018

ESTE'S YOUNG STARS TRAVEL AWARD:

DEEP, FAST, AND SHALLOW LEARNING IN HUMANS AND MACHINES

University of Indiana | Bloomington, USA 2018

PUBLIC SPEAKING

PANELIST: THE FUNDAMENTALS OF ARTIFICIAL INTELLIGENCE

(2018) | *Accelerate AB*

PANEL MODERATOR: ARTIFICIAL INTELLIGENCE IN BUSINESS

(2017) | C-Tribe Festival

EDINBURGH PRE-WIRED WORKSHOP: INTRODUCTION TO MACHINE LEARNING

(2014) | Workshop for Local Students Under 19 Years of Age Interested In Computing

ACADEMIC SERVICE

Reviewer for 2017 Reinforcement Learning and Decision Making Conference

LEADERSHIP

President: Edinburgh University Hoppers

(2014-2016) Edinburgh University Women in Technology Club

- Cultivated a community for women in computer science at the U of E.
- Fundraised and organized activities to support women in CS including, hackathons, workshops, technical talks, conferences, and coding competitions.

Hoppers Committee Member

(2014) Edinburgh University Women in Technology Club

- Gave talks and developed workshops for women in Computer Science.
- Mentored women in developing and submitting research to a national colloquium.

Pre-Wired Mentor

(2013-2014) Edinburgh University Young Scientific Researchers' Association

- Helped young U18 students learn programming skills.
- Gave a hand-written digit recognition tutorial to students.