

# ALEXANDRA KEARNEY

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

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.

A.L. Edwards, **A. Kearney**, M.R. Dawson, R.S. Sutton, and P.M. Pilarski, "[Temporal-Difference Learning to Assist Human Decision Making during the Control of an Artificial Limb](#)," 1st Multidisciplinary Conference on Reinforcement Learning and Decision Making (RLDM), Oct. 25–27, Princeton, New Jersey, USA, 2013. 5 pages.

**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. (Oral Presentation and Abstract)

**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. Travnik, 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) | University of Alberta

**SCIENCE GRADUATE SCHOLARSHIP**

(2017) | University of Alberta

**WALTER H. JOHNS GRADUATE FELLOWSHIP**

(2017) | University of Alberta

**CANADA GRADUATE SCHOLARSHIPS – MASTER'S PROGRAM**

(2017) | NSERC

**ANITA BORG MEMORIAL SCHOLARSHIP - EMEA**

(2014) | Google

**PEOPLES' CHOICE POSTER**

(2013) | British Computing Society: Lovelace Colloquium

**TRAVEL AWARDS  
& SCHOOLS**

**NEUROSCIENCE OF CONSCIOUSNESS WINTER SCHOOL**

CIFAR | Montebello, QC 2018 | 30% acceptance

**DEEP LEARNING & REINFORCEMENT LEARNING SUMMER SCHOOL**

CIFAR | Toronto, ON 2018 | 20% acceptance

**ESTE'S YOUNG STARS TRAVEL AWARD:**

**DEEP, FAST, AND SHALLOW LEARNING IN HUMANS AND MACHINES**

UNIVERSITY OF INDIANA | Bloomington, USA 2018

**ACADEMIC  
SERVICE**

Organizer for 2019 Barbados Workshop on Reinforcement Learning  
Reviewer for 2017 Reinforcement Learning and Decision Making Conference

**PUBLIC SPEAKING  
&  
INTERVIEWS**

**PANELIST: THE FUNDAMENTALS OF ARTIFICIAL INTELLIGENCE**

(2018) | *Accelerate AB*

**PANEL MODERATOR: CULTURE FIT REAL-TALK**

(2018) | *University of Alberta*

**PANELIST: DIVERSITY IN TECHNOLOGY**

(2017) | *University of Alberta*

**PANEL MODERATOR: ARTIFICIAL INTELLIGENCE IN BUSINESS**

(2017) | *C-Tribe Festival*

**INTERVIEWED: THE NEW INTELLIGENCE**

(2017) | *Gateway Magazine*

**UNDERGRADUATE RESEARCH: OPPORTUNITIES AND EXPERIENCES**

(2014) | *Edinburgh University Hoppers: lunch and learn*

**EDINBURGH PRE-WIRED WORKSHOP: INTRODUCTION TO MACHINE LEARNING**

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

**PREDICTION FOR ROBOTIC PROSTHETICS**

(2013) | *Glenrose Rehabilitation Summer Research Presentation*

**LEARNING OVER MULTIPLE TASKS FOR MYOELECTRIC PROSTHETICS**

(2013) | *BLINC Research Presentation*

**CONTEXT LEARNING FOR MYOELECTRIC PROSTHETICS**

(2013) | *Reinforcement Learning Group Summer Tea Time Talks*

**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.

**Vice President: Edinburgh University SocieTEA**

(2015-2016) Edinburgh University Tea Society

- Organized, developed, and ran events for people who like tea.

**Homebrew Website Club Meetup Coordinator**

(2015-2016) Indieweb Camp

**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 machine learning tutorial to students.