

ALEXANDRA KEARNEY

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OVERVIEW | Undergraduate student interested in promoting real-world applications of machine learning

EDUCATION | **ARTIFICIAL INTELLIGENCE AND COMPUTER SCIENCE**, University Of Edinburgh

Expected Graduation: 2016

HONOURS HIGH SCHOOL DIPLOMA, Brentwood College School

Graduation: 2012

PROJECTS | **EX-ARM: MYOELECTRICALLY CONTROLLED ROBOTIC THIRD ARM**

Research Internship (2013)

- Designed and built a system that collected data from a user's muscles to control a robotic third arm.
- Built intelligent agents to predict user's controls.

PROJECT OMAHA: STOCK MARKET PREDICTION

Personal Project: Smart Data Hackathon (2013) | Won "Most Surprising" in Object-oriented programming competition

- Built a web scraper to collect historical stock data and relevant news headlines.
- Used reinforcement learning to predict daily stock movement.
- Featured in Hackathon video: <http://goo.gl/YNia4y>

KINCECT BASED HUMAN-ROBOT AGENT INTERACTION

University of Alberta (2012)

- Built a background subtraction for use on people with disabilities.
- Designed a human-machine interaction installation for deployment in the Glenrose rehabilitation hospital.

DR JEKYLL AND MR HYDE: MULTI-AGENT CONCURRENT LEARNING

University of Alberta (2011) | Won *Peoples' Choice* at Lovelace Colloquium Poster Presentation (2013).

- Designed and ran experiments where two agents with different policies alternated control of a robot.
- One agent would be in control, but both agents would be learning from experiences.
- Presented at *Manning Awards Celebration of Innovation* (2011).

LEADERSHIP | **EDINBURGH UNIVERSITY HOPPERS COMMITTEE MEMBER**

(2013-2014) A group aimed at encouraging women to engage in the tech community

- Presented research opportunities; mentored informatics students; promoted participation in a national colloquium.

PRE-WIRED MENTOR

(2013-2014) A group aimed at encouraging youth to pursue computer science

- Designed and presented a workshop introducing students to Machine Learning; mentored students at meetings.

SEMINAR COORDINATOR

(Summer 2013) RLAI Group TTT

- Coordinated and promoted *Tea Time Talk* seminar series where recent research is presented to faculty active in the Artificial Intelligence community.

HIGH SCHOOL ROBOTICS PROGRAMME DEVELOPMENT CONSULTANT

(2011-2012) Brentwood College School

- Used prior experience in competitive youth robotics to help teachers design a program introducing students to mechanical engineering practices and programming.

EXPERIENCE | **SMART DATA HACKATHON COORDINATOR**

University of Edinburgh

2014 | Event website: www.comp-soc.com/ilwhack

- Organizer of a week-long of a Hackathon encouraging students to use data to improve their community.
- Developed coordination and communication skills in a community outreach setting.

REINFORCEMENT LEARNING & ARTIFICIAL INTELLIGENCE LAB INTERN

University of Alberta

2013 | Supervisors: Richard Sutton PhD and Patrick Pilarski PhD

- Designed and implemented a myoelectric control system for a robotic third arm in Java.
- Collected and analyzed data to evaluate the performance of a novel machine learning algorithm.
- Contributed to international publications, as listed below.

HIGH SCHOOL INTERNSHIP PROGRAMME

University of Alberta

2012 | Supervisors: Richard Sutton PhD and Joseph Modayil PhD

- Built a background subtraction program for use in a physical rehabilitation center.
- Mentored younger interns and gave technical presentations to people of varying backgrounds.

HIGH SCHOOL INTERNSHIP PROGRAMME

University of Alberta

2011 | Supervisors: Richard Sutton PhD and Patrick Pilarski PhD

- Learned and applied machine learning techniques without prior knowledge.
- Built and tested efficiency of novel multi-agent system on robotic platform.
- Designed and carried out a novel experiment demonstrating benefits of letting agents learn from other's actions.

PUBLICATIONS

PARTITION TREE LEARNING FOR IMPROVED CONTROL OF MYOELECTRIC PROSTHETICS

Kearney, A.; Koop, A.; Pilarski, P. M. 2013. Temporal-Difference Learning to Assist Human Decision Making during the Control of an Artificial Limb. Abstract, poster, and oral presentation at Women in Machine Learning (WiML), Oct. 5th, Lake Tahoe, Nevada, USA.

TEMPORAL-DIFFERENCE LEARNING TO ASSIST HUMAN DECISION MAKING DURING THE CONTROL OF AN ARTIFICIAL LIMB

Edwards, A. L.; Kearney, A.; Dawson, M. R.; Sutton, R. S.; Pilarski, P. M. 2013. Temporal-Difference Learning to Assist Human Decision Making during the Control of an Artificial Limb. Extended abstract (4 pages) and poster, in the 1st Multidisciplinary Conference on Reinforcement Learning and Decision Making (RLDM), Oct. 25–27, Princeton, New Jersey, USA.

PARTITION TREE LEARNING FOR PROSTHETIC CONTROL

Koop, A.; Kearney, A.; Bowling, M.; Pilarski, P. M. 2014. Partition Tree Learning for Prosthetic Control. PLoS ONE, in preparation.

PUBLIC SPEAKING

EDINBURGH PRE-WIRED WORKSHOP: INTRODUCTION TO MACHINE LEARNING

(2014) Workshop for local students under 19 years of age interested in computing

UNDERGRADUATE RESEARCH OPPORTUNITIES AND EXPERIENCES

(2014) Edinburgh University Hoppers: Lunch and Learn

PARTITION TREE LEARNING FOR IMPROVED MYOELECTRIC CONTROL

(2013) Women in Machine Learning Workshop

LEARNING OVER MULTIPLE TASKS FOR MYOELECTRIC PROSTHETICS

(2013) BLINC research group presentation

CONTEXT LEARNING FOR MYOELECTRIC PROSTHETICS

(2013) Reinforcement learning group summer tea time talks

PREDICTION FOR ROBOTIC PROSTHETICS

(2013) Glenrose rehabilitation summer research presentation

HONOURS & AWARDS

PEOPLES' CHOICE POSTER

2013 BCS Women Lovelace Colloquium

Continuation of *Jekyll & Hyde: Multi Agent Reinforcement Learning*

MOST SURPRISING PROJECT

2013 Object Oriented Programming Competition

Project Omaha: Reinforcement Learning Based Stock Market analysis

BEST POSTER

2011 High School Internship Poster Presentation

Initial Work: *Jekyll and Hyde: Multi Agent Reinforcement Learning*

ADVANCED PLACEMENT SCHOLAR WITH DISTINCTION

2012 College Board Award

For Performance on examinations