

# Eric Graves

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## RESEARCH INTERESTS

Artificial Intelligence, Reinforcement Learning, Representation Learning

## EDUCATION

**University of Alberta** – *Doctor of Philosophy (in Progress)* May 2017 - present

Supervisor: Professor Richard S. Sutton.

**University of Alberta** – *Master of Science (converted to PhD)* September 2015 - April 2017

Supervisor: Professor Richard S. Sutton.

**University of Alberta** – *Bachelor of Science, Specialization in Computing Science* September 2008 - June 2012

Completed industrial internship on a research project to automatically generate code using graph algorithms.  
Varsity Track and Field athlete, competed in the high jump.

## PUBLICATIONS

### Conferences

Imani E\*, **Graves E\***, White M (2018): An Off-Policy Policy Gradient Theorem using Emphatic Weightings. In Proceedings of the Conference on Neural Information Processing Systems (NeurIPS). \*Joint first author.

Schenk K, Lari A, Church M, **Graves E**, Duncan J, Miller R, Desai N, Zhao R, Szafron D, Carbonaro M, Schaeffer J (2013): ScriptEase II: Platform Independent Story Creation Using High-Level Patterns. AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment (AIIDE).

Church M, **Graves E**, Duncan J, Lari A, Miller R, Desai N, Zhao R, Carbonaro M, Schaeffer J, Sturtevant NR, Szafron D (2011): A Demonstration of ScriptEase II. AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment (AIIDE).

## HONOURS AND AWARDS

**Queen Elizabeth II Graduate Scholarship** September 2016

Awarded for outstanding academic achievement in a graduate program in Alberta.

**Jimmie Condon Scholarship** January 2010

Awarded for athletic and academic excellence in a post-secondary program in Alberta.

## RESEARCH EXPERIENCE

**University of Alberta** – *Research Assistant* May 2016 - present

- Designed, programmed, and executed experiments to investigate and illustrate strengths and weaknesses of policy-based and value-based learning algorithms.
- Assisted Professor Richard S. Sutton in preparing chapter 13 (Policy Gradient Methods) of the textbook *Reinforcement Learning: An Introduction*.
- Empirically investigated the equivalence of soft Q-learning and actor-critic algorithms in the entropy-regularized reinforcement learning setting for a course project. Results showed that while the two algorithms are equivalent in expectation, they possess different variance properties, resulting in different empirical performance.
- Compared unsupervised sparse representation learning techniques, including sparse autoencoders and

sparse dictionary learning. Experiments were implemented in Python using TensorFlow.

## PROFESSIONAL EXPERIENCE

**Gamesys Canada** (Edmonton, AB) – *Software Developer*

**Game Studio Team**

July 2014 - October 2015

- Worked in a multi-disciplinary team to create innovative online games, using a variety of technologies.
- Created novel algorithms to procedurally generate balanced, completable game levels using graph theory.
- Optimized functions and fixed bugs in the in-house programming language translation engine.

**Poker Information Team**

July 2012 - July 2014

- Built systems that enforce game integrity for one of the first legal online poker offerings in New Jersey.
- Created a system to automatically detect and prevent fraud during gameplay in real time which led to an United States patent application.

**University of Alberta** – *Video Game Tools Developer*

January 2010 - April 2011

- Designed, implemented, debugged, refactored, and documented a large portion of the ScriptEase 2 Tool, which uses a novel user interface to automatically generate code for arbitrary video game engines, allowing non-technical designers to quickly and easily script complex logic without writing code.

## TEACHING EXPERIENCE

**University of Alberta** – *Teaching Assistant*

January 2016 - December 2016

- Assisted in creation of assignment prompts, held office hours, and marked essays, presentations, and projects for the undergraduate course in ethics and technology, CMPUT 300: Computers and Society.
- Volunteered as a playtester and mentor for INTD 350: Game Design Principles and Practices.
- Volunteered as an overload teaching assistant for CMPUT 366: Intelligent Systems.

## PATENT APPLICATIONS

Graves E, et al., inventors; Gamesys Ltd., assignee. Systems and Methods for Detection and Management of Fraudulent or Collusive Poker Game Play. United States patent application US 20,160,071,369. 2016 Mar 10.