Kawin Ethayarajh

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Education

Stanford University

PhD, Computer Science Fall 2019 -

University of Toronto

MSc, Computer Science (4.00 CGPA) 2019

BSc (Hons), Computer Science (4.00 CGPA) 2017

Awards

NSERC Postgraduate Scholarship - Doctoral: $63,000 2019

Canadian equivalent to NSF Fellowship.

NSERC Canada Graduate Scholarship - Doctoral: $105,000 (declined) 2019

Rhodes Scholarship Finalist 2017

University of Toronto Fellowship: $11,200 2017

John H. Moss Scholarship: $16,650 2017

Given to the top graduating student, for academics and leadership.

Chancellor Northrop Frye Gold Medal 2017

For the graduating student with the highest academic standing.

NSERC Undergraduate Student Research Award: $4,500 2015

Awarded by NSERC (Canadian NSF) to undergraduate researchers.

Bank of Montreal National Scholarship: $75,000 2013

Merit–based scholarship granted to only 8 students across Canada in 2013.

Governor General's Academic Medal (Bronze) 2013

Research & Engineering

Google

Intern, AdsAI Summer 2019

- created a novel method for embedding heterogeneous hypergraphs using autoencoders
- achieved 10% improvement on F_1 score over previous state-of-the-art for multi-label node classification
- developed a new method of training hypergraph embeddings at scale on Borg using sharding

Intern, Research & Machine Intelligence Summer 2018

- conceived and built a pipeline for zero-shot relation extraction using pre-trained QA models
- increased precision by 12% and $F_{0.5}$ score by 0.023 over baseline method on a consumer products corpus
- worked with Apache Beam, Flume, and Tensorflow

University of Toronto

Research Asst, NLP Group 2017 – 2019

- derived an unsupervised sentence embedding approach that got state-of-the-art results on similarity tasks, beating baseline by up to 44.4% (Best Paper, proceedings of Repl4NLP at ACL 2018)
- published proof of why analogies (e.g., *king is to queen as man is to woman*) exist in word vector spaces
- published theoretical analysis of social biases in word embedding spaces

Research Asst, Signal Processing & Oral Communication Lab 2016 – 2017

- used psycholinguistics to study seasonal changes in mood across 100K Reddit users (published)
- found that a small cohort was acutely sensitive to seasonal changes, supporting mainstream hypothesis

Research Asst, Faculty of Law Summer 2016

- made the first citation prediction model for a common law system, using 52K legal decisions (published)
- used network theory (HITS) and machine learning (SVMs) to predict citations with 93.8% accuracy

Research Asst, Software Engineering Lab Summer 2015

- implemented "lifted transformations" in Lifted DSLTrans, a model transformation language
- funded by NSERC (Canadian NSF) undergraduate research award

Product & Project Mgmt

Review of Undergraduate Computer Science (RUCS)

Founder & Editor-in-Chief — 2015 – 2016

- started the first undergraduate publication dedicated solely to computer science (rucs.ca)
- built readership of several thousand students and mentored every subsequent editor-in-chief
- RUCS is entering its 4^{th} year (2018) and has published work from UToronto, Cornell, and MIT

Governing Council of the University of Toronto

University Affairs Board Member — 2015 – 2016

- appointed to a board of the university's highest governing body to shape student affairs
- debated and voted on several key issues, including student privacy and data collection

The Artisan Toolkit (Far & Wide Collective)

Reporting Officer — 2013 – 2015

- helped manage $600,000 in funds to teach business practices to thousands of traditional Afghan artisans
- helped distribute content across many media in English, Dari & Pashto to literate and illiterate users

Publications

1. **How Contextual are Contextualized Word Representations? Comparing the Geometry of BERT, ELMo, and GPT-2 Embeddings.**
   Kawin Ethayarajh.
   EMNLP 2019, long.

2. **Rotate *King* to get *Queen*: Word Relationships as Orthogonal Transformations in Embedding Space.**
   Kawin Ethayarajh.
   EMNLP 2019, short.

3. **Understanding Undesirable Word Embedding Associations.**
   Kawin Ethayarajh, David Duvenaud, and Graeme Hirst.
   ACL 2019, long.

4. **Towards Understanding Linear Word Analogies.**
   Kawin Ethayarajh, David Duvenaud, and Graeme Hirst.
   ACL 2019, long.

5. **Unsupervised Random Walk Sentence Embeddings: A Strong but Simple Baseline.**
   Kawin Ethayarajh.
   ACL 2018 - Repl4NLP. **Best Paper.**

6. **A Rose by Any Other Name: Understanding Judicial Decisions that Do Not Cite Precedent.**
   Kawin Ethayarajh, Andrew Green, and Albert Yoon.
   Journal of Empirical Legal Studies. 15(3): 563-596.

7. **The Effect of Photoperiod on the Mood of Reddit Users.**
   Kawin Ethayarajh and Frank Rudzicz.
   Cyberpsychology, Behavior, and Social Networking. 20(4): 238-245.