

# Eric Crawford

PHD CANDIDATE IN MACHINE LEARNING

McGill University, Montreal, Quebec, Canada

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## Education

### Candidate for PhD, Computer Science

Montreal, Quebec, Canada

McGILL UNIVERSITY

2014-Present

- Cumulative GPA: 4.0/4.0
- Member of Reasoning and Learning Lab

### Master of Mathematics, Computer Science

Waterloo, Ontario, Canada

UNIVERSITY OF WATERLOO

2012-2014

- Cumulative GPA: 91.80%
- Member of Computational Neuroscience Research Group

### Bachelor of Mathematics, Honours Computer Science, Co-op, CogSci Option

Waterloo, Ontario, Canada

UNIVERSITY OF WATERLOO

2007-2012

- Cumulative GPA: 88.07%
- Dean's Honours List with Distinction

## Publications

### CONFERENCE / JOURNAL ARTICLES

- **Crawford, E.**, and Pineau, J. (2020). Exploiting Spatial Invariance for Scalable Unsupervised Object Detection. *AAAI*.
- **Crawford, E.**, and Pineau, J. (2019). Spatially Invariant Unsupervised Object Detection with Convolutional Neural Networks. *AAAI*.
- Dong, Y, Shen, Y., **Crawford, E.**, van Hoof H., and Cheung, J.C.K. (2018). BanditSum: Extractive Summarization as a Contextual Bandit. *EMNLP*.
- Kroger, B., **Crawford, E.**, Bekolay, T., and Eliasmith, C. (2016). Modeling interactions between speech production and perception: speech error detection at semantic and phonological levels and the inner speech loop. *Frontiers in Computational Neuroscience*.
- **Crawford, E.**, Gingerich, M., and Eliasmith, C. (2015). Biologically plausible, human-scale knowledge representation. *Cognitive science*.
- **Crawford, E.**, Gingerich, M., and Eliasmith, C. (2013). Biologically plausible, human-scale knowledge representation. *Conference of the Cognitive Science Society*.

### WORKSHOPS AND PREPRINTS

- **Crawford, E.**, and Pineau, J. (2019). Spatially Invariant, Label-free Object Detection. *NeurIPS Workshop on Perception as Generative Reasoning*.
- Venkattaramanujam, S.\*, **Crawford, E.**\*, Doan, T., and Precup, D. (2019). Self-supervised Learning of Distance Functions for Goal-Conditioned Reinforcement Learning. *arXiv preprint arXiv:1907.02998*.
- **Crawford, E.**, and Pineau, J. (2018). Spatially Invariant Attend, Infer, Repeat. *NeurIPS Workshop on Modeling the Physical World*.
- **Crawford, E.**, Rabusseau, G. and Pineau, J. (2017). Sequential Coordination of Deep Models for Learning Visual Arithmetic. *arXiv preprint arXiv:1809.04988*.
- Voelker, A., **Crawford, E.**, and Eliasmith, C. (2014). Learning large-scale heteroassociative memories in spiking neurons. *Unconventional Computation and Natural Computation*.

### THESES

- **Crawford, E.** (2015). Biologically plausible, human-scale knowledge representation. Master of Mathematics Thesis, University of Waterloo.

## SOFTWARE

- **Crawford, E.** (2013-2015). MPI backend for the Nengo neural simulator. <https://github.com/nengo/nengo-mpi>.
- **Crawford, E.** (2010-2015). Contributions to Nengo neural simulator core library. <https://github.com/nengo/nengo>.

## Awards & Scholarships

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|---|-----------------|
| <b>Alexander Graham Bell Canada Graduate Scholarship - Doctoral - \$70,000</b> - NSERC  | 2016/09-2018/08 |
| <b>David R. Cheriton Graduate Scholarship - \$20,000</b> - University of Waterloo       | 2012/09-2014/08 |
| <b>Alexander Graham Bell Canada Graduate Scholarship - Masters - \$17,000</b> - NSERC   | 2012/09-2013/08 |
| <b>President's Graduate Scholarship - \$10,000</b> - University of Waterloo             | 2012/09-2013/08 |
| <b>Ontario Graduate Scholarship - \$15,000 (Declined)</b> - Gov. of Ontario             | 2012/09-2013/08 |
| <b>Computational Neuroscience Summer Program - \$4,000</b> - University of Pennsylvania | 2011/05-2011/07 |
| <b>Undergraduate Student Research Award - \$4,500</b> - NSERC                           | 2011/01-2011/04 |
| <b>Undergraduate Student Research Award - \$4,500</b> - NSERC                           | 2010/01-2010/04 |
| <b>Industrial Undergraduate Student Research Award - \$4,500</b> - NSERC                | 2008/09-2008/12 |
| <b>President's Scholarship - \$2,000</b> - University of Waterloo                       | 2007/09-2007/12 |

## Experience

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### Machine Learning Consultant

PERSONA IDENTITIES INC.

San Francisco, California, USA

2019

- Implemented machine learning solutions for document verification applications.

### Teaching Assistant

SCHOOL OF COMPUTER SCIENCE, MCGILL UNIVERSITY

Montreal, Quebec, Canada

2014-2016

- Implemented game-playing platform for AI course project, ran tournament between submitted agents.
- Held office hours, marked papers, gave tutorials.

### Teaching Assistant

DEPARTMENT OF COMPUTER SCIENCE, UNIVERSITY OF WATERLOO

Waterloo, Ontario, Canada

2012-2014

- Held office hours, marked papers, gave tutorials.

### Research Assistant

DEPARTMENT OF OTORHINOLARYNGOLOGY, UNIVERSITY OF PENNSYLVANIA

Philadelphia, Pennsylvania, USA

2011/05-2011/08

- Implemented computational methods for identifying neural receptive fields based on neurophysiological data.

### Lead Developer

COMPUTATIONAL NEUROSCIENCE RESEARCH GROUP, UNIVERSITY OF WATERLOO

Waterloo, Ontario, Canada

2010/01-2010/05, 2011/01-2011/05

- Designed and implemented GPU backend for Nengo neural simulation package.

### Developer

ACRONYM SOFTWARE

Waterloo, Ontario, Canada

2009/05-2009/09

- Implemented UI features for wood and masonry engineering software in C++ and C#.

## Skills

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TensorFlow, PyTorch, Python, Linux, C, C++, MPI, CUDA, LaTeX, Git, Java, Scheme