Daniel Rasmussen

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Employment

2013–present **Senior Staff Machine Learning Engineer, Co-founder**, *Applied Brain Research, Inc.*, Waterloo, ON

2014–2016 **Postdoctoral Associate**, *Princeton University*, Princeton, NJ, USA

Education

2010–2014 **Ph.D., Computer Science (Theoretical Neuroscience)**, *University of Waterloo*, Waterloo, ON, Canada

2008–2010 **M.Math., Computer Science (Theoretical Neuroscience)**, *University of Waterloo*, Waterloo, ON, Canada

2004–2008 **B.A., Computer Science and Philosophy**, *Mount Allison University*, Sackville, NB, Canada

Journal Articles

A. Voelker, D. Rasmussen, and C. Eliasmith. A spike in performance: Training hybrid-spiking neural networks with quantized activation functions. *arXiv*, 2002.03553(v2):1–18, 2020

D. Rasmussen. NengoDL: Combining deep learning and neuromorphic modelling methods. *Neuroinformatics*, 17:611–628, 2019

D. Rasmussen, A. Voelker, and C. Eliasmith. A neural model of hierarchical reinforcement learning. *PLoS ONE*, 12(7):1–39, 2017

T. Bekolay, J. Bergstra, E. Hunsberger, T. DeWolf, T. C. Stewart, D. Rasmussen, X. Choo, A. R. Voelker, and C. Eliasmith. Nengo: a Python tool for building large-scale functional brain models. *Frontiers in Neuroinformatics*, 7(48):1–13, 2014

D. Rasmussen and C. Eliasmith. A spiking neural model applied to the study of human performance and cognitive decline on Raven's Advanced Progressive Matrices. *Intelligence*, 42:53–82, 2014

D. Rasmussen and C. Eliasmith. Modeling brain function: Current developments and future prospects. *JAMA Neurology*, 70(10):1325–1329, 2013

D. Rasmussen and C. Eliasmith. God, the devil, and details: Fleshing out the predictive processing framework (commentary on Clark). *Behavioral and Brain Sciences*, 36:223–224, 2013

C. Eliasmith, T. C. Stewart, X. Choo, T. Bekolay, T. DeWolf, Y. Tang, and D. Rasmussen. A large-scale model of the functioning brain. *Science*, 338(6111):1202–1205, 2012

D. Rasmussen and C. Eliasmith. A neural model of rule generation in inductive reasoning. *Topics in Cognitive Science*, 3(1):140–153, 2011

Book Chapters

C. Eliasmith, D. Rasmussen, and T. C. Stewart. Biological cognition: Syntax. In C. Eliasmith, editor, *How to build a brain: A neural architecture for biological cognition*, chapter 4. Oxford University Press, 2013

Conference Proceedings

D. Rasmussen and C. Eliasmith. A neural model of hierarchical reinforcement learning. In P. Bello, M. Guarini, M. McShane, and B. Scassellati, editors, *Proceedings of the 36th Annual Conference of the Cognitive Science Society*, pages 1252–1257, Austin, 2014. Cognitive Science Society

D. Rasmussen and C. Eliasmith. A neural reinforcement learning model for tasks with unknown time delays. In M. Knauff, M. Pauen, N. Sebanz, and I. Wachsmuth, editors, *Proceedings of the 35th Annual Conference of the Cognitive Science Society*, pages 3257–3262, Austin, 2013. Cognitive Science Society

D. Rasmussen and C. Eliasmith. A Neural Model of Rule Generation in Inductive Reasoning. In R. Cattrambone and S. Ohlsson, editors, *Proceedings of the 32nd Annual Conference of the Cognitive Science Society*, pages 61–66, Austin, 2010. Cognitive Science Society

Awards and Grants

2011–2014 **Alexander Graham Bell Canadian Graduate Scholarship**, *Natural Sciences and Engineering Research Council of Canada*

2011 **Young Researchers' Computational Neuroscience Award**, *Bernstein Association for Computational Neuroscience*

2010 **Best Paper Award (Computational Modelling) CogSci2010**, *Cognitive Science Society*

2009–2011 **Ontario Graduate Scholarship**, *Ontario Ministry of Training, Colleges, and Universities*

2008–2014 **President's Graduate Scholarship**, *University of Waterloo*

2008–2010 **David R. Cheriton Graduate Scholarship**, *University of Waterloo*

2008–2009 **NSERC Postgraduate Scholarship**, *Natural Sciences and Engineering Research Council of Canada*

2008 **David Gilchrist Chalmers Memorial Prize**, *Mount Allison University*

2007–2008 **NSERC Undergraduate Student Research Award**, *Natural Sciences and Engineering Research Council of Canada*

2004–2008 **Mount Allison Scholarship**, *Mount Allison University*

2004–2008 **Ruggles-Gates Scholarship**, *Mount Allison University*

Invited Talks

2015 **Reinforcement learning in Nengo**, *Nengo Summer School 2015*, University of Waterloo, Waterloo, ON

2015 **Biological neural modelling of hierarchical reinforcement learning**, *9th Barbados Workshop on Reinforcement Learning*, Holetown, Barbados

2013 **Neural modelling of hierarchical reinforcement learning**, *Gatsby Computational Neuroscience Unit*, University College London, London, UK

2013 **Biologically plausible neural modelling of complex reinforcement learning**, *Janelia Farm Research Campus*, Howard Hughes Medical Institute, Ashburn, VA

2013 **Adaptive behaviour via hierarchical reinforcement learning in a biologically plausible neural architecture**, *CIFAR NCAP Summer School*, University of Toronto, Toronto, ON

2013 **Introduction to the NEF/Nengo**, *Telluride Neuromorphic Cognition Engineering Workshop*, Institute of Neuromorphic Engineering, Telluride, CO

2013 **Large-scale functional neural modelling**, *Large Scale Applications Using Cortical Processing Models Workshop*, DARPA, Washington, DC

2012 **Modelling the brain: From neurons to behaviour**, *Mount Allison University*, Sackville, NB

2011 **Spiking neural modelling applied to intelligence tests and aging**, *Bernstein Center for Computational Neuroscience*, Bernstein Association, Berlin, Germany

Theses

Ph.D. Hierarchical reinforcement learning in a biologically plausible neural architecture

Supervisor: Chris Eliasmith

M.Math. A neural modelling approach to investigating general intelligence

Supervisor: Chris Eliasmith

Teaching Experience

2012 **Sessional Instructor**, *University of Waterloo*

Teaching an undergraduate introductory computer science course. Responsible for creating and delivering lectures to a class of 100 students, meeting with students during office hours, and designing assignments and exams.

2011–2013 **Certificate in University Teaching**, *University of Waterloo*

Advanced certificate program in university teaching, based on in-class evaluations, workshops, and theoretical research.

2010–2011 **Fundamentals of University Teaching**, *University of Waterloo*

Certificate program involving workshops and hands-on training.

2009–2011 **Instructional Apprentice**, *University of Waterloo*

Running labs, tutorials, and help sessions for various Computer Science courses.

2007–2008 **Teaching Internship Program**, *Mount Allison University*

Assisting in teaching introductory Computer Science classes, along with instructional workshops and faculty mentorship.