

ABRAHAM NUNES

5909 Veterans' Memorial Lane, 8th Floor
Abbie J. Lane Memorial Building, QEII Health Sciences Centre
Halifax, NS, B3H 2E2, Canada
DALHOUSIE UNIVERSITY · NUNES@DAL.CA · WWW.ABRAHAMNUNES.COM

EDUCATION

- Sep 2017- **Doctor of Philosophy**
Faculty of Computer Science, Dalhousie University
Computational Neuroscience & Psychiatry
Supervisor: Prof. Thomas Trappenberg
- 2014-Present **RCPPSC Psychiatry Residency & Clinician Investigator Program**
Dalhousie University
- 2009-2014 **Doctor of Medicine**
University of Alberta, Edmonton, AB, Canada
Combined MD/MBA program
- 2009-2014 **Master of Business Administration**
University of Alberta, Edmonton, AB, Canada
Combined MD/MBA program
- 2005-2009 **Bachelor of Science (Hons.)**
University of Western Ontario, London, ON, Canada
Honours Thesis: Fatigue induced tremor in the tibialis anterior

ACADEMIC AND CLINICAL POSITIONS

- 2014-Present **Resident Physician**
Department of Psychiatry, Dalhousie University

ADMINISTRATIVE AND VOLUNTEER POSITIONS

- 2017-Present **Residency Postgraduate Committee Member**
Clinician Investigator Program, Dalhousie University
Represented clinician investigator program trainees on the program's governing committee.
- 2017-Present **Dalhousie Representative**
Clinician Investigator Trainee Association of Canada (CITAC)
Liaising between the national association of clinician scientist trainees and learners at Dalhousie.

- 2017-Present **Resident Resesarch Representative (also 2014-2015)**
Department of Psychiatry, Dalhousie University
 Represented the Dalhousie Psychiatry Residents' association on the departmental research committee
- 2014-2015 **Resident Representative**
Department of Psychiatry Strategic Planning Committee, Dalhousie University
 Resident representative on committee reviewing the department of psychiatry's strategic plan for research
- 2016-2017 **CaRMS Interviewer**
Department of Psychiatry, Dalhousie University
 Served as an interviewer for applicants to the Dalhousie Psychiatry residency program

AWARDS

- 2018 **Scotia Scholars Award**
Nova Scotia Health Research Foundation
- 2018 **Killam Scholarship**
Killam Trusts & Faculty of Medicine, Dalhousie University
- 2017 **Clerks' Choice Award**
Department of Psychiatry, Dalhousie University
 "In recognition of the outstanding teaching contributions by a Resident"
- 2016 **Best Presentation Award, Psychiatry Resident**
Department of Psychiatry, Dalhousie University
 Dalhousie Department of Psychiatry 26th Annual Research Day
- 2016 **Dr. Charles J. David Prize in Psychiatry**
Department of Psychiatry, Dalhousie University
 "In recognition for outstanding display of compassion, sensitivity and a high degree of competence in patient care during PGY-2"
- 2016 **Clerks' Choice Award**
Department of Psychiatry, Dalhousie University
 "In recognition of the outstanding teaching contributions by a Resident"
- 2015 **Horizon Health Network PGY-1 Resident of the Year**
Department of Psychiatry, Dalhousie University
 "In recognition for exemplary academic and clinical attributes during core PGY-1 psychiatry rotations in Saint John, NB"
- 2014 **E. William Kuder Memorial Prize in Surgery**
Faculty of Medicine and Dentistry, University of Alberta
 For highest standing during surgical rotations of medical training
- 2013 **Top 40 Under 40, Edmonton**
Avenue Magazine, Edmonton
[Link to Article](#)
- 2011 **Queen Elizabeth II Graduate Scholarship, Master's Level**

University of Alberta

- 2011 **Dr. A.R. Oakley Prize in Anatomy**
Division of Anatomy, University of Alberta
- 2011 **AIHS Summer Studentship**
Alberta Innovates, Health Solutions
For clinical outcomes and health economics research in Division of Cardiac Surgery,
University of Alberta
- 2010 **Dr. Elliot Gelfand Award for Cardiovascular Research**
Division of Cardiac Surgery, University of Alberta
For research pertaining to clinical outcomes of mechanical circulatory support
- 2009 **CREATE Award for Biomedical Engineering**
Natural Science and Engineering Research Council of Canada
For research into motor control of human grasping at University of Calgary

FUNDED PROJECTS

- 2017 **Feasibility of Lisdexamfetamine Dimesylate for Treatment of Bulimia Nervosa**
NSHA Research Fund (\$ 100,000; PI: Dr. Aaron Keshen)
Along side this feasibility study, we will be using computational modeling to determine the effects of lisdexamfetamine dimesylate on reinforcement learning in patients with bulimia nervosa.
- 2016 **Instrumental Control in Binge-Eating Disorder and Bulimia Nervosa**
NSHA Research Fund (\$ 4,995); Dalhousie Psychiatry Resident Research Fund (\$ 2,500)
Using reinforcement learning models to study the balance of goal-directed and habitual control in patients with bulimia nervosa and binge-eating disorder

PUBLICATIONS

Submitted

- Nunes A**, Helson TJ, Dixon L, Trappenberg TP, & Keshen AR. Characteristic impairments of goal-directed and habitual control in bulimia nervosa . *Under Review at eLife* [\[PDF\]](#)
- Nunes A**, et al. (ENIGMA Bipolar Disorder Working Group). Using structural MRI to identify bipolar disorders – 13 site machine learning study in 3020 individuals from the ENIGMA Bipolar Disorder Working Group . *Under Review at Molecular Psychiatry*
- Nunes A**, Rudiuk A, & Trappenberg TP. An Algorithm for Clustering Decision-Making Phenotypes from Behavioural Data. *Under Review for Cognitive Computational Neuroscience 2018*.
- Rudiuk A, **Nunes A**, & Trappenberg TP. Reward Correlation Induces a Tradeoff between Model-Based Control and Exploitative Choice. *Under Review for Cognitive Computational Neuroscience 2018*.
- Nunes A**, and Rudiuk A. The Importance of Constraint Smoothness for Parameter Estimation in Computational Cognitive Modeling. *Under Review at PeerJ. arXiv preprint 2018 at* [\[PDF\]](#)

Peer-Reviewed

- Fard FS, **Nunes A**, and Trappenberg TP. An Actor Critic with an Internal Model. *Cognitive Computational Neuroscience 2017* [PDF]
- Nunes A**, MacArthur RGG, Kim D, Singh G, Buchholz H, Chatterley P, Klarenbach SW. A Systematic Review of the Cost-Effectiveness of Long-Term Mechanical Circulatory Support. *Value in Health* 2016;19(4):494-504
- Nunes A**, Hajek T, and Alda M. Early and delayed treatment of bipolar disorder (Letter). *British Journal of Psychiatry* 2014;205(5):411
- Jonker ID, **Nunes A**, Elhenawy AM, Das D, and MacArthur RG. Double aortic arch presenting in an adult with dysphagia. *Journal of Cardiac Surgery* 2013;28(6):670-1
- Nunes A**, Buchholz H, Sinnadurai S, and MacArthur RG. Long-term mechanical circulatory support of an adult patient with Down Syndrome. *Annals of Thoracic Surgery* 2012;93:1305-07
- Nielsen CA, Deegan EG, Hung ASL, and **Nunes A**. Potential effects of sleep deprivation on sensorimotor integration during quiet stance in young adults. *WURJ* 2010;1

Preprints

- Nunes A**. word2brain. *bioRxiv* 2018 [PDF]
- Nunes A**. How to Assess Speech, Language, and Thought Form. *Figshare* 2016
<https://dx.doi.org/10.6084/m9.figshare.3039766.v1> (A tutorial for psychiatry clerkship students)

Software

- Nunes A**, Rudiuk A, & Trappenberg, TP. Fitr: A Toolbox for Computational Psychiatry. 2016; doi:10.5281/zenodo.495735.
[View the GitHub Repository]
- Nunes A**. Paradigms: A Compilation of Behavioural Tasks in Python. 2016; [View the GitHub Repository]

PRESENTATIONS

Peer-Reviewed Meetings

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| 2017 | Of meals, models, and habits: A review of reinforcement learning studies in eating disorders
Nunes A , Trappenberg TP, and Keshen AR
Canadian Psychiatric Association Meeting, Ottawa 2017 |
| 2017 | Fitr: An Accessible Toolbox for Computational Psychiatry
Nunes A & Trappenberg TP
Canadian Psychiatric Association Meeting, Ottawa 2017 |
| 2017 | The Prognosis of Treated Neurosyphilitic Psychosis: A Review of the Literature
Nunes A , Manning A, & Zhou C
Canadian Psychiatric Association Meeting, Ottawa 2017 |
| 2016 | Of meals, models, and habits in the brain: A review of reinforcement learning studies in eating disorders
Nunes A , Trappenberg TP, Helson TJ, and Keshen AR |

- Dalhousie Department of Psychiatry Research Day; Halifax, NS, October 2016
- 2016 Modeling psychosis: The computational nature of hallucination and delusion
Nunes A & Trappenberg TP
 Atlantic Provinces Psychiatric Association Conference; St. John, NB, June 2016
- 2015 Reinforcement Learning in a Nutshell ([PDF](#))
Nunes A, and Trappenberg, T
 Dalhousie Department of Psychiatry Research Day; Halifax, NS, 2015
- 2012 Systematic Review of the Cost-Effectiveness of Mechanical Circulatory Support
Nunes A, Wiebe N, Chatterley P, MacArthur RG, and Klarenbach SW
 Canadian Cardiovascular Congress; Toronto, ON, 2012
- 2012 Cost of Long-Term Mechanical Circulatory Support at Large Canadian Transplantation Centre
Nunes A, MacArthur RG, and Klarenbach SW
 Canadian Cardiovascular Congress; Toronto, ON, 2012
- 2012 Double Aortic Arch Presenting in an Adult with Dysphagia
 Jonker ID, **Nunes A**, Elhenawy AM, Das D, and MacArthur RG
 Canadian Cardiovascular Congress; Toronto, ON, 2012
- 2012 Use of Recombinant Factor VIIa for Refractory Haemorrhage in Patients Receiving Mechanical Circulatory Support
Nunes A, Hruczkowski J, Nahirniak S, and MacArthur RG
 Canadian Cardiovascular Congress; Toronto, ON, 2012
- 2012 Edmonton Experience with Venovenous Extracorporeal Membrane Oxygenation in Critically Ill Adults with Severe Respiratory Failure
Nunes A, Hruczkowski J, MacArthur RG, and Singh G
 Canadian Cardiovascular Congress; Toronto, ON, 2012
- 2012 First Canadian Report of Destination Therapy With the HeartWare HVAS in a Biventricular Configuration
Nunes A, Hruczkowski J, Das D, and MacArthur RG
 Canadian Cardiovascular Congress; Toronto, ON, 2012
- 2011 Clinical Outcomes of Long-Term Mechanical Circulatory Support at a Large Canadian Transplantation Centre
Nunes A, Buchholz H, Sinnadurai S, Mullen JC, Singh G, Meyer SR, Wang S, Modry DL, and MacArthur RG
 Canadian Cardiovascular Congress; Vancouver, BC, 2011
- 2011 Bridge to Decision Using Short Term Ventricular Assist Device For Critically Ill Moribund Patients
 Mutsuga M, **Nunes A**, Sinnadurai S, Meyer S, MacArthur RG, Mullen J, Rebeyka I, Ross D, and Buchholz H
 Canadian Cardiovascular Congress; Vancouver, BC, 2011
- 2011 A Protocol for the Assessment of Heart Mate II Patients' Fitness to Drive
Nunes A, Sinnadurai S, MacArthur RG, and Buchholz H
 Canadian Cardiovascular Congress; Toronto, ON, 2011

Other Slide Sets

- 2015 Genome-Wide Association Studies in Psychiatry
Department of Psychiatry Journal Club Series
Slides available at my website ([LINK](#))
- 2014 The Neuroendocrinology of Psychopathy
Department of Psychiatry Journal Club Series
Slides available at my website ([LINK](#))

ADDITIONAL WORKS

- 2014-Present **Psychiatry: Questions & Answers**
Updated drafts available at my website ([LINK](#))
A flash-card format book I am slowly writing while studying, available for free as it is developed
- 2015 **A Brief Guide to Writing a Simple Research Proposal**
Published on my Website ([LINK](#))
A template guide for Dalhousie Psychiatry residents' research proposals
- 2015 **Web Developer**
CBTHalifax.ca
Designed and deployed a website for my wife's psychology practice
- 2014-2015 **Scholarly project requirement development**
Department of Psychiatry, Dalhousie University
Worked with psychiatry residency program director and research director to revise the requirements for residents' mandatory scholarly project

TEACHING EXPERIENCE

I am involved in the teaching of medical students whilst they rotate through various psychiatry services, as well as during on-call shifts. I have also delivered lectures for the psychiatry core rotation seminar series. Intermittently, I have taught sessions in Dalhousie's clinical skills course, focusing on psychiatric interviewing.

TECHNICAL SKILLS

Scientific Computing: Python, R, Stan, MATLAB, Mathematica, \LaTeX
Key Packages: TensorFlow (primary), Edward, Scientific Python Family, Scikit-Learn
Key Methods: Reinforcement Learning, Neural Networks, Black-Box Optimization
Probabilistic programming, Computational cognitive modeling
Web/Mobile: JavaScript, PHP, HTML5, CSS, Objective-C
Other: Java, Perl, Git, SVN

INTERESTS

Clinical: Neuropsychiatry, Neuromodulation, Psychopharmacology
Research: Computational psychiatry, Reinforcement learning, Basal ganglia, Model-based control
Other: Theory of complex systems, Machine learning, How to teach neuroscience in psychiatry

MEMBERSHIPS

- Canadian Psychiatric Association
- Doctors Nova Scotia
- Maritime Resident Doctors

REFERENCES

Available upon request.