Curriculum Vitae for
Jonathan J Hunt
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Research Experience

10/2022-ongoing	**Senior Staff Research Scientist**	Twitter
10/2019-09/2022	**Staff Research Scientist**	Twitter
12/2016-09/2019	**Senior Research Scientist**	Google DeepMind
10/2014-12/2016	**Research Scientist**	Google DeepMind
09/2013-09/2014	**Scientist**	Brain Corporation
05/2012-09/2013	**Scientific Programmer**	Brain Corporation
05/2012-2016	**Adjunct Researcher**	Queensland Brain Institute, University of Queensland
06/2011-05/2012	**Postdoctoral Research Fellow**	Queensland Brain Institute, University of Queensland
2003-2006 Summers/part-time	**Research Assistant**	Massey University

Education

PhD 2007-2011
University of Queensland, Australia

Title	Natural scenes and the development of the visual cortex
Supervisors	Prof. Geoffrey J Goodhill and Prof. Jason Mattingley

Bachelor of Science (Honours, 1st class) 2003-2006
Massey University, New Zealand

Major	Mathematical Physics
Project Title	Polysaccharide sequence reconstruction from digest patterns
Supervisor	A/Prof. Martin Williams

Publications and talks

Full-text publications (including conference, workshop papers and preprints)[1]

See also my Google Scholar profile.

Cetin, E., Chamberlain, B., Bronstein, M., **Hunt, J.J.** (2023) Hyperbolic Deep Reinforcement Learning. *International Conference on Learning Representations*

Wang, Z., **Hunt, J.J.**, Zhou, M. (2023) Diffusion Policies as an Expressive Policy Class for Offline Reinforcement Learning. *International Conference on Learning Representations*

O'Brien, C., Wu, H., Zhai, S., Guo, D., Shi, W., **Hunt, J.J.** (2022) Should I send this notification? Optimizing push notifications decision making by modeling the future. *Arxiv Preprint*

O'Brien, C., Thiagarajan, A., Das, S., Barreto, R., Verma, C., Hsu, T., Neufeld, J., **Hunt, J.J.** (2022) Challenges and approaches to privacy preserving post-click conversion prediction. *Arxiv Preprint*

Yue, Y.*, Xie, Y., Wu, H., Jia, H., Zhai, S., Shi, W., **Hunt, J.J.*** (2022) Learning to Rank For Push Notifications Using Pairwise Expected Regret. *Arxiv Preprint*

Anelli, V.W., Kalloori, S., Ferwerda, B., Belli, L., Tejani, A., Portman, F., Lung-Yut-Fong, A., Chamberlain, B., Xie, Y., **Hunt, J.J.**, Bronstein, M., Shi, W. (2021) RecSys 2021 Challenge Workshop: Fairness-aware engagement prediction at scale on Twitters Home Timeline. *ACM Conference Series on Recommender Systems (RecSys)*

Belli, L., Tejani, A., Portman, F., Lung-Yut-Fong, A., Chamberlain, B., Xie, Y., Lum, K., **Hunt, J.J.**, Bronstein, M., Anelli, V.W., Kalloori, S., Ferwerda, B., Shi, W. (2021) The 2021 RecSys Challenge Dataset: Fairness is not optional. *ACM Conference on Recommender Systems Challenge Proceedings*

O'Brien, C., Liu, K.S., Neufeld, J., Barreto, R., **Hunt, J.J.** (2021) An Analysis Of Entire Space Multi-Task Models For Post-Click Conversion Prediction. *ACM Conference Series on Recommender Systems (RecSys) Late Breaking Results*

[1] Full texts of all publications are available on my website https://me.net.nz and hyperlinked here.

Mirza, M., Jaegle, A., **Hunt, J.J.**, Guez, A., Tunyasuvunakool, S., Muldal, A., Weber, T., Karkus, P., Racanire, S., Buesing, L., Lillicrap, T., Heess, N. (2020) Physically Embedded Planning Problems: New Challenges for Reinforcement Learning. *Arxiv preprint*

Barreto, A., Borsa, D., Hou, S., Comanici, G., Aygun, E., Hamel, P., Toyama, D., **Hunt, J.J.**, Mourad, S., Silver, D., Precup, D. (2019) The Option Keyboard: Combining Skills in Reinforcement Learning. *Neural Information Processing Systems*

Hunt, J.J., Barreto, A., Lillicrap, T.P., Heess, N. (2019) Composing Entropic Policies using Divergence Correction. *International Conference on Machine Learning*

Hunt, J.J., Barreto, A., Lillicrap, T.P., Heess, N. (2018) Entropic Policy Composition with Generalized Policy Improvement and Divergence Correction. *NeurIPS 2018 Deep Reinforcement Learning Workshop*

Hunt, J.J., Barreto, A., Lillicrap, T.P., Heess, N. (2018) Entropic Policy Composition with Generalized Policy Improvement and Successor Features. *NeurIPS Infer2Control Workshop*

Barreto, A., Dabney W., Munos, R., **Hunt, J.J.**, Schaul,T. Silver, D., van Hasselt, H. (2017) Successor Features for Transfer in Reinforcement Learning. *Neural Information Processing Systems*

Barreto, A., Dabney W., Munos, R., **Hunt, J.J.**, Schaul,T. Silver, D., van Hasselt, H. (2017) Transfer in Reinforcement Learning with Successor Features and Generalised Policy Improvement. *ICML LifeLong Learning Workshop*

Rae, J.*, **Hunt, J.J.***, Danihelka, I., Harley, T., Senior, A., Wayne, G., Graves, A. Lillicrap, T.P. (2016) Scaling Memory-Augmented Neural Networks with Sparse Reads and Writes. *Neural Information Processing Systems*

Dulac-Arnold G., Evans R., van Hasselt H., Sunehag P., Lillicrap T.P., **Hunt J.J.**, Mann T., Weber T., Degris T., Coppin B. (2016) Deep Reinforcement Learning in Large Discrete Action Spaces. *Arxiv preprint*

Lillicrap, T.P.*, **Hunt, J.J.***, Pritzel, A., Heess, N., Erez, T., Tassa, Y., Silver, D., Wierstra, D. (2016) Continuous control with deep reinforcement learning. *International Conference on Learning Representations*

Heess N.*, **Hunt, J.J.***, Lillicrap, T.P., Silver, D. (2015) Memory-based control with recurrent neural networks. *NIPS Deep Reinforcement Learning Workshop*

Hughes, N., **Hunt, J.J.**, Sengpiel, F., Ibbotson, M., Goodhill, G.J. (2014) Stripe-rearing changes multiple aspects of the structure of primary visual cortex. *NeuroImage*

Hunt, J.J., Dayan, P., Goodhill, G.J. (2013) Sparse Coding Can Predict Primary Visual Cortex Receptive Field Changes Induced by Abnormal Visual Input. *PloS Computational Biology*

Hunt, J.J., Mattingley, J., Goodhill, G.J. (2011) Randomly oriented edge arrangements dominate naturalistic arrangements in binocular rivalry. *Vision Research*

Hunt, J.J., Ibbotson, M., Goodhill, G.J. Sparse coding on the spot: spontaneous retinal waves suffice for orientation selectivity. *Neural Computation*

Forbes, E.M.*, **Hunt, J.J.***, Goodhill, G.J. (2011) The combinatorics of neurite self-avoidance. *Neural Computation*

Hunt, J.J., Bosking, W., Goodhill, G.J. (2011). Statistical structure of lateral connections in the primary visual cortex. *Neural Systems & Circuits*

Hunt, J.J.*, Giacomantonio, C.E.*, Tang, H., Mortimer, D., Jaffer, S.,Vorobyov, V., Ericksson, G., Sengpiel, F., Goodhill, G.J. (2009). Natural scene statistics and the structure of orientation maps in the visual cortex. *Neuroimage*

Hunt, J.J., Cameron, R.G., Williams, M.A.K. (2006) On the simulation of enzymatic digest patterns: the fragmentation of oligomeric and polymeric galacturonides by endopolygalacturonase II. *Biochimica et Biophysica Acta*

* equal contributions

Conference presentations

Hunt, J.J., Dayan, P., Goodhill, G.J. Sparse coding model of binocular receptive field development reproduces changes in abnormal rearing. *Cosyne 2012*, Salt Lake City USA.

Hughes, N., **Hunt, J.J.**, Cloherty, S.L., Ibbotson, M.R., Sengpiel, F., Goodhill, G.J. (1/2013) *6th Australian Workshop on Computational Neuroscience*, Melbourne, Australia

Hunt, J.J., Ibbotson, M., Goodhill, G.J. (11/2012) An efficient coding model of mostly spot-like visual input: oriented receptive fields can still dominate. *Society for Neuroscience*, New Orleans.

Hunt, J.J. Dayan, P., Goodhill, G.J. (11/2012) A simple unsupervised learning model is a good predictor of receptive field changes in abnormal rearing conditions. *Society for Neuroscience*, New Orleans.

Hughes, N., **Hunt, J.J**, Cloherty, S.L., Ibbotson, M.R., Sengpiel, F., Goodhill, G.J. (9/2012) Gaussian process methods for evaluating visual map changes following abnormal visual input. *Queensland Brain Institute 4th Brain Plasticity Symposium*, Brisbane, Australia.

Hunt, J.J. Dayan, P., Goodhill, G.J. (9/2011) Coding with two eyes: an unsupervised learning model of binocular receptive field development. *Queensland Brain Institute-Munich Centre for Neurosicences Symposium*, Queensland Brain Institute, Brisbane, Australia.

Hunt, J.J., Mattingley, J.M., Goodhill, G.J. (9/2010) Emphasizing entropic edges: entropic edge arrangements dominate visual perception. *Brain Plasticity Symposium*, Queensland Brain Institute, Brisbane, Australia.

Hunt, J.J., Giacomantonio, C.E., Tang, H., Mortimer, D., Jaffer, S., Vorobyov, V., Ericksson, G., Sengpiel, F., Goodhill, G.J. (11/2008) Abnormal visual input during development does not alter the co-circularity statistics of orientation maps in visual cortex. *Society for Neuroscience*, Washington DC.

Hunt, J.J., Giacomantonio, C.E., Tang, H., Mortimer, D., Jaffer, S., Vorobyov, V., Ericksson, G., Sengpiel, F., Goodhill, G.J. (9/2008) Co-circularity statistics in cat primary visual cortex are not driven by visual input. *Brain Plasticity Symposium*, Brisbane, Australia.

Hunt, J.J., Smith, D.H., Mortimer, D., Giacomantonio, C.E., Tang, H., Ericksson, G., Sengpiel, F., Goodhill, G.J. (7/2007) The influence of natural image scene statistics on the structure of orientation maps. *Vision Down Under*, Cairns, Australia.

Demonstrations

Hunt, J.J., O'Connor, P. (12/2013) A mobile development platform for adaptive machine learning and neuromorphic computing in robotics. *Neural Information Processing Systems*, Lake Tahoe, CA, USA.

Patents

Hunt, J.J (Filed 2022) Learning to rank for push notifications.

Danihelka, I., Wayne, G.D., Wang, F-M, Grefenstette E., Rae, J.W., Graves, A.B., Lillicrap, T.P., Harley, T.J.A., **Hunt, J.J.** (Filed 2017, Granted 2021) Augmenting neural networks with sparsely-accessed external memory

Lillicrap, T.P., **Hunt, J.J.**, Pritzel, A., Heess, N.M.O., Erez, T., Tassa, Y., Silver, D., Wierstra, D.P. (Filed 2016, Granted 2020) Continuous control with deep reinforcement learning. US Patent 10776692

Hunt, J.J., Sinyavskiy, O., Kimball, R.H., Hall, E.M., Levin, J.A., Bender, P., Canoy, Canoy, M-D.N. (Filed 2016, Granted 2017) Apparatus and methods for developing parallel networks using a general purpose programming language. US Patent 9652713

Hunt, J.J., Sinyavskiy, O. (Filed 2013, Granted 2016) Apparatus and methods for developing parallel networks using a general purpose programming language. US Patent 9330356

Sinyavskiy, O., **Hunt, J.J.** (Filed 2013, Granted 2016) Multithreaded apparatus and methods for implementing parallel networks. US Patent 9390369

Hunt, J.J., Sinyavskiy, O. (Filed 2013, Granted 2015) Spiking neuron classifier apparatus and methods using conditionally independent subsets. US Patent 9195934

Talks

Improving long-term user engagement with push notifications using model-based reinforcement learning (07/22) *Nvidia RecSys Summit (online)*

A model-based reinforcement learning approach to optimizing push notification decision making. (05/22) *LinkedIn (online)*

Is now a good time? Using reinforcement learning to make optimal decisions about when to send push notifications. (04/22) *European Conference on Information Retrieval Industry Day, Stavanger, Norway*

Modeling What Matters: Recommender Systems That Model Business Goals More Directly (09/21) *Instagram Workshop on Recommendation Systems at Scale (online)*

Ranking for Push Notifications (05/21) *Netflix (online)*

Challenges in Recommender Systems (12/20) *University College London (online)*

Challenges in Recommender Systems (10/20) *Oxford University (online)*

Transfer and generalisation in RL (07/18) *Brain Corporation, San Diego, USA*

Transfer and generalisation in RL (07/18) *Intel AI, San Diego, USA*

Deep Reinforcement Learning for Robotic Control (03/18) *Human Brain Project Workshop on Cognitive Systems for Non-Specialists* Technical University Munich, Garching, Germany

Reinforcement Learning in Continuous Action Spaces (04/17) *Nantes Machine Learning Meetup* Nantes, France.

Does your brain use JPEG? Image representations in the visual cortex (9/2011) *School of Chemical and Physical Sciences, Victoria University, New Zealand*.

Does your brain use JPEG? Image representations in the visual cortex (9/2011) *Institute of Fundamental Sciences Lecture Series, Massey University, New Zealand*.

Statistical machine translation (2009) *Maths journal club, University of Queensland, Australia*.

Cryptographically secure random number generators (2009) *Maths journal club, University of Queensland, Australia*.

Moore's law meets neuroscience (2009) *Barcamp Brisbane, Australia*

Mapping the brain: understanding the layout of the visual cortex (10/2007) *Institute of Fundamental Sciences Lecture Series, Massey University, New Zealand.*

Continuing education

2009	Okinawa Computational Neuroscience Summer School	3 week course
2009	Apple Xcode Tools Workshop	2 day course
2008	Kioloa Machine Learning Summer School	2 week course

Supervision

2012-2016	Co-supervision (20%) of Nick Hughes	PhD	Neural Plasticity via Visual Cortical Maps
2011	Co-supervised Nick Hughes	Mathematics honours project	Gaussian process estimators of orientation preference maps
2010/11	Co-supervised Elizabeth Forbes	Summer research project	Combinatorics of Dscam1
2008	Co-supervised Tim Lamberton	3rd year project	Position-angle dependence of orientation preferences in primary visual cortex

Teaching

2020	Lecturer		Data Science	Code First Girls
2011, 2010	Guest lecturer	MATH3104	Mathematical Biology	University of Queensland
2010	Tutor	MECH3750	Engineering Analysis II	University of Queensland
2010	Tutor	HRSS3100	Research Methodology	University of Queensland
2009	Tutor	STAT2202	Probability Models	University of Queensland
2008	Tutor	MATH3104	Mathematical Biology	University of Queensland
2008, 2007	Tutor/Guest lecturer	MATH2200	Scientific computing	University of Queensland
2005	Private tutor		High school physics	New Zealand
2004	Lab demonstrator	124.101/2	Physics	Massey University

Professional Activities

2011 Administrative assistant for the Australian Course in Advanced Neuroscience

Peer review

Reviewer for European Workshop on Reinforcement Learning (EWRL) [2022]

Reviewer for Knowledge Discovery and Data Mining Conferece (SIGKDD) [2022-23]

Reviewer for International Conference on Learning Representations (ICLR) [2016-23, 2021 outstanding reviewer]

Reviewer for Association for the Advancement of Artificial Intelligence (AAAI) [2018, 20-21]

Reviewer for Neural Information Processing Systems (NeurIPS) [2012-22]

Reviewer for International Conference on Machine Learning (ICML) [2017-19, 21, 23]

Reviewer for NeurIPS Reproducibility Challenge [2019]

Ad-hoc review for INFORMS Journal on Computing [2020]

Ad-hoc review for Scientific Reports [2018]

Ad-hoc review for Journal of Process Control [2018]

Several ad-hoc reviews for Network: Computation in Neural Systems [2008-12]

Ad-hoc review for PLoS Computational Biology (with Geoff Goodhill) [2007]