Dougal Maclaurin

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Education

Harvard University

- PhD, physics, 2016
- Advisor: Ryan P. Adams
- Research group: Harvard Intelligent Probabilistic Systems
- Thesis: Modeling, Inference and Optimization With Composable Differentiable Procedures

University of Melbourne

- MPhil, physics, 2010
- Thesis: New Applications of the Diamond Nitrogen-Vacancy Center

University of Melbourne

- BSc (hons), mathematical physics, 2008

Work

Day Zero Diagnostics, Inc

- Founder, 2016 - present

Google, Inc

- Software engineering intern, summer 2014

Element Energy (London)

- Energy consultant, 2007

Honors

- 2014 Best paper award, Uncertainty in Artificial Intelligence (“Firefly Monte Carlo”)
- 2010 Frank Knox Memorial Fellowship: two years’ full tuition and stipend for Harvard graduate study
- 2009 Perfect 990/990 in advanced physics GRE
- 2008 Dixon Research Scholarship: top graduating physics honors student at the University of Melbourne

- 2004 University of Melbourne National Scholarship: full tuition and stipend for undergraduate degree
- 2003 Beazley Medal: top graduating high school student in Western Australia

Publications

- R. Gomez-Bombarelli, J. Aguilera-Iparraguirre, T. D. Hirzel, D. Duvenaud, D. Maclaurin, M. A. Blood-Forsythe, H. Sik Chae, M. Einzinger, D. Ha, T. Wu, G. Markopoulos, S. Jeon, H. Kang, H. Miyazaki, M. Numata, S. Kim, W. Huang, S. Hong, M. Baldo, R. P. Adams & Alan Aspuru-Guzik, Design of efficient molecular organic light-emitting diodes by a high-throughput virtual screening and experimental approach Nature Materials, 2016
- D. Duvenaud*, D*, J. Aguilera-Iparraguirre R. Gomez-Bombarelli, T. Hirzel, A. Aspuru-Guzik, R. P. Adams, Neural molecular fingerprints, NIPS 2015
- D. Duvenaud*, D. Maclaurin* and R. P. Adams, Early stopping is nonparametric variational inference, AISTATS, 2016
- D. Maclaurin, D. Duvenaud, R. P. Adams, Autograd: effortless gradients in pure Numpy, ICML 2015 AutoML workshop
- D. Maclaurin*, D. Duvenaud* and R. P. Adams, Gradient-based hyperparameter optimization through reversible learning, ICML 2015
- D. Maclaurin and R. P. Adams, Firefly Monte Carlo: Exact MCMC with Subsets of Data, UAI 2014, (best paper award)
- V. Venkatachalam, D. Brinks, D. Maclaurin, D. R. Hochbaum, J. M. Kralj, A. E. Cohen, Flash memory: photochemical imprinting of neuronal action potentials onto a microbial rhodopsin, JACS, 136, 2529 (2014)
- D. Maclaurin*, V. Venkatachalam*, H. Lee, A. E. Cohen, Mechanism of voltage-sensitive fluorescence in a microbial rhodopsin, PNAS, 110, 5939 (2013)
- D. R. Hochbaum, Y. Zhao, S.L. Farhi, N. Klapoetke, C.A. Werley, V. Kapoor, P. Zou, J.M. Kralj, D. Maclaurin, N. Smedemark-Margulies, J.L. Saulnier, G.L. Boulting, C. Straub, Y. Ku Cho, M. Melkonian, G. Ka-Shu Wong, D.J. Harrison, V.N. Murthy, B.L. Sabatini, E.S. Boyden, R.E. Campbell and A.E. Cohen, All-optical electrophysiology in mammalian neurons using engineered microbial rhodopsins, Nature Methods, 11, 825 (2014)
- J. S. Hodges, N. Y. Yao, D. Maclaurin, M. D. Lukin, C. Rastogi, D. Englund, Time-keeping with electronic spin states in diamond, Physical Review A, 87, 032118 (2013)
- D. Maclaurin, L. T. Hall, A. M. Martin, L. C. L. Hollenberg, Nanoscale magnetometry through quantum control of nitrogen-vacancy centers in rotationally diffusing nanodiamonds, New Journal of Physics, 15, 013041 (2013)
- D. Maclaurin, M.W. Doherty, L. C. L. Hollenberg, A. M. Martin, Measurable quantum geometric phase from a rotating single spin, Physical Review Letters, 108, 240403 (2012)
- J. M. Kralj, A. D. Douglass, D. R. Hochbaum, D. Maclaurin, A. E. Cohen, Optical recording of action potentials in mammalian neurons using a microbial rhodopsin, Nature Methods, 9, 90 (2012)
- L. P. McGuinness, Y. Yan, A. Stacey, D. A. Simpson, L. T. Hall, D. Maclaurin, S. Prawer, P. Mulvaney, J. Wrachtrup, F. Caruso, R. E. Scholten, L. C. L. Hollenberg, Quantum measurement and orientation tracking of fluorescent nanodiamonds inside living cells, Nature

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- D. Maclaurin, A. D. Greentree, J. H. Cole, L. C. L. Hollenberg and A. M. Martin, Single atom-scale diamond defect allows a large Aharonov-Casher phase, Physical Review A 80, 040104(R) (2009)

* Equal contribution

Patents

- R.P. Adams, J. Aguilera-Iparraguirre, A. Aspuru-Guzik, D. Duvenaud, R. Gomez-Bombarelli, T.D. Hirzel, and D. Maclaurin, “Combinatorial assembly of donor-bridge-acceptor fragments for organic light emitting diodes”, US Patent pending (filed 2014)
- A. E. Cohen, D. Maclaurin, D. R. Hochbaum, J. M. Kralj, “Systems and methods for imaging at high spatial and/or temporal resolution”, US patent 20150004637

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