

Scott C. Lowe

Current positions

- since 2018 **Postdoctoral Research Fellow**, *Faculty of Computer Science, Dalhousie University*, Halifax, Canada.
- since 2018 **Postdoctoral Research Fellow**, *Vector Institute*, Toronto, Canada.
(Joint affiliation.)

Education

- 2012–2017 **Doctor of Philosophy (Ph.D. in Neuroinformatics)**, *Institute for Adaptive and Neural Computation, School of Informatics, University of Edinburgh*, Edinburgh, UK.
Thesis: Decoding information from neural populations in the visual cortex. [Thesis \(PDF\)](#), [Abstract \(PDF\)](#), [Lay Summary \(PDF\)](#). Supervisors: Profs Mark van Rossum, Stefano Panzeri, and Alex Thiele.
- 2011–2012 **MSc with Distinction, in Neuroinformatics by Research**, *University of Edinburgh*, Edinburgh, UK, *average 75.3% — for comparison, a Distinction at $\geq 70\%$ is approximately equivalent to $\geq 3.75/4$ US GPA.*
Thesis: *An information theoretic analysis of perceptual learning data from macaque V1 and V4*, Supervisors: Profs Alex Thiele and Stefano Panzeri.
- 2007–2011 **MSci with First Class Honours, in Natural Sciences (Mathematics and Physics)**, *Durham University*, Durham, UK, *average 73.4% — for comparison, a First Class at $\geq 70\%$ is approximately equivalent to $\geq 3.75/4$ US GPA.*
Thesis: *On Artificial Neural Networks*, Supervisor: Dr Ian Jermyn.

Experience

- 2018 **Postdoctoral Research Fellow**, *School of Psychology & School of Mathematics, University of Nottingham*, Nottingham, UK.
- 2017 **Co-founder and CSO**, *Cortirio*, London, UK.
Co-founder and Chief Scientific Officer at [Cortirio](#), developing a portable brain scanner for diagnosing traumatic brain injury.
- 2017 **Entrepreneurial Fellow**, *Entrepreneur First*, London, UK.
- 2015 **Technical Research Assistant**, *Rochefort Lab, Centre for Integrative Physiology, University of Edinburgh*, Edinburgh, UK.
Development of tools for analysis of calcium imaging data from mouse primary visual cortex.
- 2010 **Web Technician**, *FleXtel Ltd*, Sandbach, UK.
Programming in PHP for telecoms company. Designed and coded new website selling isolated consumer product. Developed market-leading algorithms to price telephone numbers based on memorability of both numeric patterns and alphanumerical patterns <http://www.flextel.com/numbers/>.

Open source projects

- 2018 **FISSA**, a Python library for decontaminating somatic signals from 2-photon calcium imaging data, available on [GitHub](#) and [PyPI](#).
- 2016 **Superbar**, Multi-colour bar charts for MATLAB, including customisable error bars and significance comparisons, available on [GitHub](#), and through [MATLAB FileExchange](#).
- 2016 **MOPI: MATLAB/Octave Package Installer**, A simple and flexible package manager for both MATLAB and Octave, available on [GitHub](#).
- 2013–2015 **MATLAB Schemer**, A colour scheme manager for MATLAB, available on [GitHub](#), and through [MATLAB FileExchange](#).
- 2013 **Colorlab**, Perceptually uniform colormap generation, available on [GitHub](#).

Grants, honors & awards

- 2017 Placed 8th out of 91 in [NIPS 2017: Non-targeted Adversarial Attack](#) competition, NIPS2017 Conference Competition Track, organised by Google Brain, hosted by Kaggle.
- 2016 Awarded a entrepreneurial fellowship with [Entrepreneur First](#), London.
- 2015 Placed 57th out of 1049 in the [National Data Science Bowl](#) plankton species classification challenge, hosted by Kaggle.
- 2014 Placed 16th out of 504 in the [American Epilepsy Society Seizure Prediction Challenge](#), hosted by Kaggle.
- 2013 Winner of “Most Viable Business Idea” award, [Amazon Scotland Hackathon 2013](#).
- 2011 Awarded a 4-year scholarship by the University of Edinburgh School of Informatics Doctoral Training Centre in Neuroinformatics, with funding from grants EP/F500385/1 and BB/F529254/1 from the UK Engineering and Physical Sciences Research Council (EPSRC), UK Biotechnology and Biological Sciences Research Council (BBSRC), and the UK Medical Research Council (MRC).
- 2007 Awarded the Sandbach School *Boarders Trophy for Excellence in Mathematics*.

Miscellaneous courses

- July 2018 **Deep Learning & Reinforcement Learning Summer School 2018**, CIFAR & Vector Institute, Toronto, Canada, [DLRLSS2018](#).
- Feb 2018 **Deep Learning Specialization**, [deeplearning.ai](#), Coursera, *Grade: 100%*.
- Aug 2016 **Machine Learning Summer School 2016**, Universidad Católica, Arequipa, Peru, [MLSS16](#).
- Feb 2016 **Machine Learning**, Stanford University, Coursera, *Grade: 100%*.

Publications

Journal articles

- under review* **Scott C. Lowe**, Thomas Trappenberg, Sageev Oore, (*under review for 33rd Conference on Neural Information Processing Systems, 2019*), "LogAvgExp Provides a Principled and Performant Pooling Operator".
- June, 2019 Nicholas Meade*, Nicholas Barreyre*, **Scott C. Lowe**, Sageev Oore, (2019, June), "Exploring Conditioning for Generative Music Systems with Human-Interpretable Controls". In *Proceedings of the 10th International Conference on Computational Creativity, 2019*.
- Feb, 2018 Sander W. Keemink*, **Scott C. Lowe***, Janelle M. P. Pakan, Mark C. W. van Rossum, Nathalie L. Rochefort, (2018, February), "FISSA: A neuropil decontamination toolbox for calcium imaging signals". *Scientific Reports*, **8**. doi: [10.1038/s41598-018-21640-2](https://doi.org/10.1038/s41598-018-21640-2)
- Jan, 2018 Daniel Zaldivar, Jozien Goense, **Scott C. Lowe**, Nikos K. Logothetis, Stefano Panzeri, (2018, January), "Dopamine is signaled by mid-frequency oscillations and boosts output-layers visual information in visual cortex". *Current Biology*, **28**(2). doi: [10.1016/j.cub.2017.12.006](https://doi.org/10.1016/j.cub.2017.12.006).
- Aug, 2016 Janelle M. P. Pakan, **Scott C. Lowe**, Evelyn Dylida, Sander W. Keemink, Stephen P. Currie, Christopher A. Coutts, Nathalie L. I. Rochefort, (2016, August), "Behavioral-state modulation of inhibition is context-dependent and cell type specific in mouse visual cortex". *eLIFE*, **5**:e14985. doi: [10.7554/eLife.14985](https://doi.org/10.7554/eLife.14985).
- Sept, 2015 Michel Besserve, **Scott C. Lowe**, Nikos, K. Logothetis, Bernhard Schölkopf, Stefano Panzeri (2015, September), "Shifts of gamma phase across primary visual cortical sites reflect dynamic stimulus modulated information transfer". *PLoS Biology*, **13**(9): e1002257. doi: [10.1371/journal.pbio.1002257](https://doi.org/10.1371/journal.pbio.1002257).
- in preparation* **Scott C. Lowe**, Daniel Zaldivar, Yusuke Murayama, Mark C. W. van Rossum, Nikos K. Logothetis, Stefano Panzeri (to be submitted), "Lamina and Frequency Distribution of Information in Primary Visual Cortex".

Talks

- May, 2015 **Scott C. Lowe** (2015, May), "What does LFP encode?". Presented at the *CINPLA Workshop: "Inferring network activity from LFPs"*, University of Oslo, Oslo, Norway.

Poster Presentations

- Nov, 2016 D. Zaldivar, J. Goense, **Scott C. Lowe**, N.K. Logothetis, S. Panzeri, (2016, November), "Dopamine elicits lamina- and frequency-specific increase of information in the local-field-potentials of the macaque V1". Presented at the *2016 Meeting of the Society for Neuroscience*, San Diego, USA. Program No. [712.08](#).
- July, 2016 J.M.P. Pakan, **Scott C. Lowe**, E. Dylida, S.W. Keemink, S.P. Currie, C.A. Coutts, N.L. Rochefort, (2016, July). "Behavioural state modulation of inhibitory activity is context-dependent and cell-type specific in mouse V1." Presented at the *10th FENS Forum of Neuroscience*, Copenhagen, Denmark.

- Apr, 2016 J.M.P. Pakan, **Scott C. Lowe**, E. Dylida, S.W. Keemink, C.A. Coutts, N.L. Rochefort, (2016, April). "Sensory context and state-dependent modulation of inhibitory circuit activity in mouse V1". Presented at the *The Brain in Focus: New Approaches to Imaging Neurons and Neural Circuits*, Copenhagen, Denmark.
- Sept, 2016 S.W. Keemink, J.M.P. Pakan, **Scott C. Lowe**, E. Dylida, M.C.W. van Rossum, N.L. Rochefort, (2016, September). "Independent Component Analysis (ICA) approach to extract GCampP6-somatic signals from neuropil contamination". Presented at the *5th European Visual Cortex Meeting*, Kloster Seeon, Munich, Germany.
- Sept, 2016 J.M.P. Pakan, **Scott C. Lowe**, E. Dylida, S.W. Keemink, C.A. Coutts, N.L. Rochefort, (2016, September). "Context-dependent activity of inhibitory circuits in V1 during locomotion". Presented at the *5th European Visual Cortex Meeting*, Kloster Seeon, Munich, Germany.
- Apr, 2015 **Scott C. Lowe**, D. Zaldivar, Y. Murayama, M.C.W. van Rossum, N.K. Logothetis, S. Panzeri, (2015, April), "Cortical dynamics across V1 laminae generate independent frequency channels encoding visual information". Presented at the *BNA2015: Festival of Neuroscience*, Edinburgh, UK. Poster Reference: [P2-C-029](#).
- Nov, 2014 **Scott C. Lowe**, D. Zaldivar, Y. Murayama, M.C.W. van Rossum, N.K. Logothetis, S. Panzeri, (2014, November), "Different cortical layers in V1 encode different visual information in different frequency bands". Presented at the *2014 Meeting of the Society for Neuroscience*, Washington DC, USA. Program No. [532.19](#).
- July, 2014 **Scott C. Lowe**, D. Zaldivar, Y. Murayama, M.C.W. van Rossum, N.K. Logothetis, S. Panzeri, (2014, July), "Quantification of the Laminar and Frequency Structure of Information in Primary Visual Cortex". Presented at the *9th FENS Forum of Neuroscience*, Milan, Italy. Abstract number FENS-2860.
- July, 2014 **Scott C. Lowe**, D. Zaldivar, Y. Murayama, M.C.W. van Rossum, N.K. Logothetis, S. Panzeri, (2014, July), "Quantification of the Laminar and Frequency Structure of Information in Primary Visual Cortex". Presented at the *AREADNE 2014 session*, Santorini, Greece.
- Nov, 2013 **Scott C. Lowe**, X. Chen, M.C.W. van Rossum, S. Panzeri, A. Thiele, (2013, November), "Decoding spiking activity in V4, but not V1, correlates with behaviour in perceptual learning". Presented at the *2013 Meeting of the Society for Neuroscience*, San Diego, USA. Program No. [555.11](#).
- July, 2013 **Scott C. Lowe**, X. Chen, M.C.W. van Rossum, S. Panzeri, A. Thiele, (2013, July), "Decoding spiking activity in V4, but not V1, correlates with behavioural performance in perceptual learning task". Presented at the *Twenty Second Annual Computational Neuroscience Meeting: CNS*2013*, Paris, France. *BMC Neuroscience* 2013, **14**(Suppl 1):P385 doi: [10.1186/1471-2202-14-S1-P385](https://doi.org/10.1186/1471-2202-14-S1-P385).

Teaching experience

Autumn, **Neural Computation**, Tutor, University of Edinburgh.
2013

Computer skills

Languages	Python, MATLAB, C/C++, Bash
Development	Git, TDD, continuous integration
ML	PyTorch, Tensorflow, Theano, Scikit-learn
Web	PHP, Javascript, AJAX, HTML5, CSS3
Markup	Markdown, YAML, JSON, XML
Database	SQL, MySQL
Cloud comp.	Amazon EC2

References

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- Additional references available on request.