

# Curriculum Vitae

## Personal Details

Dr. Richard E. Turner  
Computational and Biological Learning Lab  
Department of Engineering  
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[Research Group webpage](#) || [Publications on Google Scholar](#)

## Education and Qualifications

- 2010            Ph.D.  
Gatsby Computational Neuroscience Unit, University College London  
Dissertation title: Statistical models for natural sounds  
Area: Machine learning and theoretical neuroscience  
Advisor: Prof. Maneesh Sahani
- 2003            M.Sci, B.A. Hons  
Gonville and Caius College, University of Cambridge, 2003  
Natural Sciences, specialism experimental and theoretical physics  
First Class Honours, awarded Duncan Bruce Memorial Prize

## Professional History

- 2018 -            *Reader in Machine Learning*, Department of Engineering, University of Cambridge
- 2018 -            *Visiting Researcher*, Microsoft Research, Cambridge
- 2018 -            *Bye Fellow*, Christ's College, Cambridge
- 2012 - 2018    *University Lecturer in Computer Vision and Machine Learning*,  
Department of Engineering, University of Cambridge
- 2015 - 2018    *Full Fellow*, Christ's College, University of Cambridge
- 2012 - 2015    *Bye Fellow*, Christ's College, University of Cambridge
- 2010 - 2012    *EPSRC Postdoctoral Research Fellow*, Computational and Biological  
Learning Lab, Department of Engineering, University of Cambridge
- 2010 - 2011    *International Scholar*, Laboratory for Computational Vision, Center for  
Neural Science, NYU, USA
- 2003 - 2004    *Research Assistant*, Centre for the Neural Basis of Hearing, University  
of Cambridge
- 2003 - 2004    *Undergraduate Supervisor*, Gonville and Caius College, University of  
Cambridge.

## Other Activities, Appointments, and Affiliations

### Reviewing (Journals)

Journal of the Acoustical Society of America, Journal of Machine Learning Research,  
Machine Learning, Computer Speech and Language, IEEE Transactions on Pattern Analysis  
and Machine Intelligence, IEEE Transactions on Signal Processing, PLoS Computational  
Biology

### **Reviewing (Conferences)**

- 2017 Area Chair, International Conference on Learning Representations
- 2013 Area Chair, Neural Information Processing Systems
- 2011 - 2016 Reviewer, Neural Information Processing Systems
- 2011 Reviewer for International Conference on Acoustic Speech and Signal Processing (ICASSP conference)
- 2011 Artificial Intelligence and Statistics
- 2015 Uncertainty and Artificial Intelligence (UAI conference)
- 2010 - 2013 Computational and Systems Neuroscience (CoSyNe conference)

### **Reviewing (Institutions and Grants)**

- 2016 Quinquennial Reviewer of the MRC Institute of Hearing Research, Nottingham
- 2012 Action on Hearing Loss Grant Review

### **Professional Memberships**

- 2010 - Member of the IEEE
- 2010 - Member of the European Association for Signal Processing
- 2010 - Member of the British Society of Audiology
- 2013 - Member of the Cambridge Big Data Strategic Initiative and C2D3

### **Organisation (not including Departmental organisation)**

- 2016 - 2018 Member of Signal and Data Analytics for Machine Learning Special Area Team
- 2013 - Founder of Hearing Research @ Cambridge an inter-department (and inter-institution) network for hearing research in Cambridge.  
[www.hearing-research.group.cam.ac.uk](http://www.hearing-research.group.cam.ac.uk)
- 2018 - Executive board member of the Big-Data Strategic Initiative and Cambridge Centre for Data Driven Discovery (C2D3). Regular member since 2013.
- 2007 Co-organised the workshop "Beyond Simple Cells: Probabilistic models for visual cortical processing", Neural Information Processing Systems conference, Whistler, Canada, 2007.
- 2007 Organised a five day workshop "Advanced Probabilistic Techniques", Gatsby Unit, London, 2007.

### **Prizes, Awards and other honours**

- 2019 - Elected Fellow of the European Laboratory for Learning and Intelligent Systems (ELLIS, <https://ellis.eu>)
- 2016 Keynote Lecture IEEE International Workshop on Machine Learning for Signal Processing
- 2016 Best paper award, Neural Information Processing Systems, Time-series workshop
- 2015 Winner of Cambridge University Students' Union Outstanding Lecturer Award
- 2011 Schwartz Foundation Travel Bursary
- 2007 Best Student Paper Award, ICA Conference, London
- 2003 Duncan Bruce Memorial Prize for Physics, University of Cambridge
- 2001 - 2003 Gonville and Caius College Scholarships

## Grants Awarded

- 2019 – 2024      EPSRC Prosperity Partnership (5 years)  
*Machine Learning for Tomorrow: Efficient, Flexible, Robust and Automated*  
Dr. R. E. Turner (PI) and Dr. J. M. Hernandez-Lobato (Co-I)  
*Vision: to develop a new generation of deep learning techniques that can learn from small numbers of examples, understand when they might be wrong, and which can continually adapt to new data.*  
*News Report: <https://tinyurl.com/y5vg8zxn>*  
£3.1m (£2m from EPSRC and £1.1m from Microsoft)
- 2019 – 2024      EPSRC CDT (5 years, extendable)  
*AI for the study of environmental risks (AI4ER)*  
Prof. S. Redfern (PI), Dr. E. Schuckburgh (Co-I), and  
Dr. R. E. Turner (Co-I)  
*Vision: To leverage the abundance of environmental data from satellites, sensors and simulators, with new advances in machine learning to support environmental decision making.*  
*News report: <https://ai4er-cdt.esc.cam.ac.uk>*  
£5.7m
- 2019 – 2024      Toyota Research Partnership (5 years)  
*Toyota-Cambridge Partnership*  
Prof. B. Byrne (PI), Prof. R. Cipolla (Co-I), Dr. R.E. Turner (Co-I),  
Prof. C. Rasmussen (Co-I), and Dr. I. Budvytis (Co-I).  
*Vision: To develop the next generation of machine learning and computer vision technologies to support all aspects of autonomous driving, from sensing to multi-agent decision making.*  
£8.5m (including £2.5m for new University Lectureships)
- 2019              Amazon Research Award (unrestricted gift)  
*Continual deep learning via meta-learning and probabilistic inference*  
Dr. R. E. Turner  
£66,000
- 2019              Improbable Worlds Ltd. Research Award (unrestricted gift)  
Dr. R. E. Turner  
£50,000
- 2017              Google Focussed Research Award (unrestricted gift)  
*Machine Learning for Climate Science*  
Dr. R. E. Turner  
£101,455
- 2017 – 2018      Baroness de Turckheim Fund Award, Trinity College (2 years)  
*An objective method for alleviating cases of poor hearing by cochlear implant listeners*

Dr. Robert Carlyon (PI), Prof. Manohar Bance and Dr. R. E. Turner (co-investigators)  
£22,233

2016 Google Focussed Research Award (unrestricted gift)  
*Reliable and Robust Deep Reinforcement Learning*  
Dr. R. E. Turner  
£57,000

2016 Facebook AI Partnership Award,  
Dr. R. E. Turner (PI), Prof. C. Rasmussen and Prof. Z. Ghahramani  
GPU server gift worth £50,000

2015 – 2017 Google European Doctoral Fellowship Award (3 years)  
Dr. R. E. Turner (for Thang Bui)  
£80,000

2015 – 2018 EPSRC Research Grant (3 years)  
*Machine Learning for Hearing Aids: Intelligent Processing and Fitting*  
Dr. R. E. Turner (PI) and Prof. Brian Moore (co-investigator)  
£720,000

2015 – 2016 Advanced Bionics Research Award (2 years)  
*New psychophysical tests for evaluating cochlear implant processing strategies*  
Dr. Robert Carlyon (PI) and Dr. R. E. Turner (co-investigator)  
£100,000

2013 – 2015 EPSRC First Grant Award (2 years)  
*Unifying audio signal processing and machine learning: a fundamental framework for machine hearing*  
Dr. R. E. Turner  
£125,000

2013 Google Research Award (unrestricted gift)  
*Recognising audio & removing noise using audio textures*  
Dr. R. E. Turner  
£40,000

2013 – 2014 Baroness de Turckheim Fund Award, Trinity College (2 years)  
*Improving the evaluation of cochlear implants*  
Dr. R. E. Turner (PI) and Dr. Robert Carlyon (co-investigator)  
£18,000

2010 – 2012 EPSRC Postdoctoral Research Fellowship (3 years)  
Dr. R. E. Turner (PI)  
£230,000

## Invited presentations

2019	Keynote	<i>Extending the frontiers of deep learning using probabilistic modelling</i> International Conference on Machine Learning, Optimization & Data science (LOD2019), Tuscany
	Keynote	<i>Extending the frontiers of deep learning using probabilistic modelling</i> Annual Symposium of the Cambridge Computational Biology Institute, Cambridge
	Invited Speaker	<i>Extending the frontiers of deep learning: data-efficiency and continual learning</i> The Deep Learning Summit, London
	Oral	<i>Non-linear ICA Using Auxiliary Variables and Generalized Contrastive Learning</i> The International Conference on Artificial Intelligence and Statistics, Okinawa, Japan*
	Oral	<i>Deterministic Variational Inference for Robust Bayesian Neural Networks</i> International Conference on Learning Representations, Vancouver, Canada*
	Oral	<i>Fast and Flexible Multi-Task Classification Using Conditional Neural Adaptive Processes</i> Neural Information Processing Systems, Vancouver, Canada* (spotlight, forthcoming)
2018	Invited Tutorial	<i>Gaussian Processes</i> Machine Learning Summer School, Madrid, Spain
	Invited Tutorial	<i>Bayesian Deep Learning</i> International Conference on Latent Variable Analysis, Guildford
	Oral	<i>Geometrically Coupled Monte Carlo Sampling</i> Neural Information Processing Systems, Montreal, Canada*
	Invited Talk	<i>Variational and Meta-learning approaches to Continual Learning</i> Amazon Research, Cambridge
	Invited Talk	<i>Variational Continual Learning</i> Microsoft Research, Cambridge
	Invited Talk	<i>Probabilistic Machine Learning</i> Improbable Worlds, London
2017	Invited Talk	<i>Variational Continual Learning</i> Amazon Research Cambridge
	Invited Tutorial	<i>Approximate Inference for Gaussian Processes</i> University of Sheffield
	Invited Talk	<i>A Unifying Framework for Gaussian Process Pseudo-point Approximations</i> University of Sheffield
	Invited Talk	<i>A Unifying Framework for Gaussian Process Pseudo-point Approximations</i> Amazon Berlin
	Invited Talk	<i>Bayesian Inference for Uncertainty Aware, Robust and Flexible Neural Networks</i> Alan Turing Institute, London

	Invited Talk	<i>A Unifying Framework for (Deep) Gaussian Process Pseudo-Point Approximations</i> University College London
	Invited Talk	<i>Machine Learning for Climate Science</i> Environmental Science in the Big-Data Era, Cambridge
	Oral	<i>Q-prop: Sample-Efficient Policy Gradient with an Off-Policy Critic</i> International Conference on Learning Representations, Toulon, France*
	Oral	<i>Magnetic Hamiltonian Monte Carlo</i> International Conference on Machine Learning, Sydney, Australia*
	Oral	<i>Sequence Tutor: Conservative fine-tuning of sequence generation models with KL-control</i> International Conference on Machine Learning Sydney, Australia*
2016	Invited Tutorial	<i>Gaussian Processes: From the Basics to the State-of-the-art</i> Imperial College London (has over 19k hits on YouTube) Web link: <a href="https://preview.tinyurl.com/y6axyry8">https://preview.tinyurl.com/y6axyry8</a>
	Keynote	<i>Gaussian Processes for Signal Processing</i> IEEE International Workshop on Machine Learning for Signal Processing, Salerno, Italy, 2016
	Invited panelist	Approximate Inference Workshop, Neural Information Processing Systems, Barcelona, Spain
	Invited Talk	<i>Deep Gaussian Processes for Classification</i> Google DeepMind, London
	Invited Talk	<i>Deep Gaussian Processes for Classification</i> University of Bern, Switzerland
	Invited Talk	<i>Gaussian Processes</i> Royal Society, London
	Invited Talk	<i>Probabilistic models for Natural Audio Signals</i> Queen Mary University, London (Bioscience)
	Invited Talk	<i>Gaussian Processes for Signal Processing</i> Imperial College London (Computer Science)
	Invited Talk	<i>Gaussian Processes for auditory neuroscience</i> Imperial College London (Bioengineering)
	Invited Talk	<i>Gaussian Processes and Intelligent Listening Tests</i> MRC Brain and Cognition Sciences Unit (Chaucer Cl.)
	Oral	<i>Deep Gaussian Processes for Classification</i> International Conference on Machine Learning, New York, USA*
	Oral	<i>Black-box Alpha Divergence Minimization</i> International Conference on Machine Learning, New York, USA*
2015	Short Oral	<i>Stochastic Expectation Propagation</i> Neural Information Processing Systems, Montreal, Canada*
	Short Oral	<i>Learning Stationary Time Series using Gaussian Processes with Nonparametric Kernels</i> Neural Information Processing Systems, Montreal. Canada*

	Invited Talk	<i>Stochastic Expectation Propagation</i> Gatsby Computational Neuroscience Unit, UCL
	Invited Talk	<i>Gaussian Processes for Signal Processing</i> Queen Mary University (Centre for Digital Music)
	Invited Talk	<i>Tree-structured sparse Gaussian Process Approximations</i> University of Denmark, DTU, Copenhagen
	Invited Talk	<i>Tree-structured sparse Gaussian Process Approximations</i> Microsoft Research Cambridge
	Invited Tutorial	<i>Visual Processing and the Statistics of Natural Scenes</i> MRC Brain and Cognition Sciences Unit
	Invited Talk	<i>Machine Learning for Signal Processing</i> Computer Science Department, Cambridge
2014	Seminar	<i>Resolving the Envelope and Fine-structure Debate in Hearing</i> Hearing Group, Cambridge
	Short Oral	<i>Tree-Structured Gaussian Process Approximations</i> Neural Information Processing Systems, Montreal, Canada
	Invited Tutorial	<i>Gaussian Process Approximations for Time-Series</i> University of Sheffield
	Invited Talk	<i>Gaussian Processes for Audio Feature Extraction</i> University of Sheffield
	Invited Talk	<i>Auditory Scene Analysis and the Statistics of Natural Sounds</i> Bernstein conference, Göttingen, Germany
	Invited Talk	<i>Unifying Signal Processing and Machine Learning</i> Microsoft Research Cambridge
	Invited Talk	<i>Connecting the Statistics of Natural Sounds with Signal Processing and Auditory Scene Analysis</i> Institute for Sound and Vibration Research, University of Southampton
	Invited Talk	<i>Probabilistic Amplitude and Frequency Demodulation</i> Toshiba Research, Cambridge
2013	Invited Talk	<i>Auditory Scene Analysis and the Statistics of Natural Sounds</i> Institute for Hearing Research, Nottingham
	Seminar	<i>A Bayesian Account of Sound Localization</i> Hearing Group, Cambridge
	Invited Talk	<i>Auditory Scene Analysis and the Statistics of Natural Sounds</i> Queen Mary University, Listening in the Wild Workshop
	Invited Talk	<i>Modulation Cascades and mid-level audition</i> British Festival of Neuroscience, Barbican Centre
	Invited Talk	<i>Machine Learning for Auditory Neuroscience</i> MRC Cognition and Brain Sciences Unit
2012	Invited Talk	<i>New views of the Kalman Filter connect machine learning, signal processing and systems identification</i> European Research Network for System Identification, Maastricht, Netherlands
	Invited Talk	<i>Auditory Scene Analysis and the Statistics of Natural Sounds</i> University of Bern, Switzerland
	Invited Talk	<i>Probabilistic Approaches to Amplitude and Frequency Demodulation</i> Hearing Group, Cambridge

2011	Short Oral	<i>Probabilistic Amplitude and Frequency Demodulation</i> Neural Information Processing Systems, Granada, Spain
	Invited Talk	<i>Decomposing Signals into a sum of AM-FM sinusoids using probabilistic inference</i> Computational Audition Workshop, Bremen, Germany
	Invited Talk	<i>Probabilistic Amplitude and Frequency Demodulation</i> Center for Neural Science, New York University, USA
2010	Invited Talk	<i>Probabilistic Auditory Scene Analysis</i> Computational Audition Workshop, UCL, London
	Invited Talk	<i>Probabilistic Amplitude Demodulation</i> ICASSP, Dallas, USA, (with Maneesh Sahani)
	Invited Talk	<i>Unifying models for natural visual scene statistics</i> Collegium Budapest Institute for Advanced Study, Budapest
	Invited Talk	<i>Probabilistic Amplitude Demodulation</i> Department of Engineering, Cambridge
2009	Invited Talk	<i>On sparsity and the over-completeness of image models</i> Frankfurt Institute of Advanced Study, Germany
2008	Invited Talk	<i>Probabilistic Auditory Scene Analysis</i> Hearing Group, Cambridge
	Invited Talk	<i>Probabilistic Auditory Scene Analysis</i> The Institute of Neuroscience, Newcastle University
	Invited Talk	<i>Probabilistic Auditory Scene Analysis</i> Gordon Conference on Sensory Coding, Il Ciocco, Italy
	Invited Talk	<i>On sparsity and the over-completeness of image models</i> Inference Group, Cavendish, Cambridge
	Oral	<i>Two problems with variational expectation-maximisation for time-series</i> Inference and Estimation in Probabilistic Time-Series Models, Newton Institute, Cambridge
2007	Invited Talk	<i>Probabilistic Amplitude Demodulation</i> Inference Group, Cavendish, Cambridge
	Invited Talk	<i>Modelling natural sounds with Gaussian Modulation Cascade Processes</i> Music, Brain and Cognition Workshop, NIPS, Whistler
	Oral	<i>Probabilistic Amplitude Demodulation</i> 7th International Conference on Independent Component Analysis & Signal Separation
	Invited Talk	<i>Vision and the statistics of Natural Scenes</i> Collegium Budapest Institute for Advanced Study, Budapest
	Invited Talk	<i>Modelling natural sounds with Gaussian Modulation Cascade Processes</i> Department of Engineering, Cambridge

\* indicates that the talk was given on my behalf by one of my PhD students or Postdoctoral Researchers



## Research co-workers

### *PhD students in my group (graduated)*

2013 - 17	Alexandre Navarro	Science Without Borders Full Scholarship, <i>now Research Scientist Babylon Health</i> <i>Thesis: Probabilistic Machine Learning for Circular Statistics</i>
2013 - 17	Thang Bui	Google European Doctoral Fellowship Award, <i>now Lecturer University of Sydney</i> <i>Thesis: Efficient Deterministic Approximate Bayesian Inference for Gaussian Process Models</i>
2013 - 17	Yingzhen Li	Schlumberger Faculty for the Future Fellowship, <i>now Researcher at Microsoft Research</i> <i>Thesis: Approximate Inference: New Visions</i>
2014 - 18	Shane Gu	Google Focussed Research Award, <i>now Research Scientist, Google Brain</i> <i>Thesis: Sample-Efficient Deep Learning for Continuous Control</i>
2014 - 18	Mateo Rojas Carulla	EPSRC Doctoral Training Centre <i>now Research Scientist, Facebook AI Research</i> <i>Thesis: Learning Transferrable Representations</i>
2015 - 18	Mark Rowland	Cambridge Centre for Analysis DTC <i>now Research Scientist, DeepMind</i> <i>Thesis: Structure in Machine Learning: Graphical Models and Monte Carlo Methods</i>

### *PhD students in my group (current)*

2016 -	James Requeima	Self-funded
2017 -	John Bronskill	Self-funded
2017 -	Siddharth Swaroop	EPSRC Doctoral Training Programme award
2017 -	William Tebbutt	Google DeepMind Research Award
2018 -	Wessel Bruinsma	IDS Award
2018 -	Andrew Foong	George and Lilian Schiff Studentship and Trinity Hall Scholarship
2018 -	Elre Olde Wage	Schlumberger Cambridge Scholarship
2019 -	Jonathan So	Harding Distinguished Postgraduate Scholarship
2019 -	Marcin Tomczak	Vice Chancellor's Award

### *Research Assistant/Associates in my group*

2013 - 14	Rosy Southwell	funded by Baroness de Turckhiem Fund Award, <i>now PhD student at UCL</i>
2014 - 15	Dr. Felipe Tobar	EPSRC First Grant <i>now Lecturer, Universidad de Chile</i>
2016 - 18	Dr. Cuong Nguyen	EPSRC Research Grant <i>now Research Scientist Amazon, Berlin</i>
2018	Hugh Bishop	funded by Google Research Award
2019	Mrinank Shama	funded by Google Research Award <i>now PhD student, Oxford</i>
2019	Michael Hutchinson	funded by Google Research Award <i>now PhD student, Oxford</i>

### *Visiting Researchers*

2015	Dr. Dan Stowell	EPSRC Research Fellowship
2017 - 18	Dr. Arno Solin	Academy of Finland Fellowship

## Outreach and engagement

- 2018 Evening with Dr. Turner, CUDAR London Engagement Series, Four Seasons Hotel, Park Lane, London. "*Artificial Intelligence: The Revolution hasn't happened yet*"
- 2016 Interviewed on BBC 5 Live's science programme *The Naked Scientist* about Artificial Intelligence
- 2014 Invited speaker, Queens' College Graduate Symposium "*Creating Tomorrow*"
- 2014 Appeared on BBC 5 Live's science programme, *The Naked Scientist* to talk about hearing and my research,
- 2013 Appeared on the BBC World Service's technology programme, *Click*, presenting my work
- 2013 News article about my research published in *Wired Magazine*