

MÁTÉ LENGYEL
CURRICULUM VITÆ
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PERSONAL DETAILS

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date of birth: 7 March 1975
marital status: married, two children
nationality: Hungarian

RESEARCH EXPERIENCE

- 2007– Lecturer in Computational Neuroscience, Computational and Biological Learning Lab, Department of Engineering, University of Cambridge
- 2007 Visiting Research Fellow, Collegium Budapest Institute for Advanced Study (Budapest, Hungary), host: Eörs Szathmáry
- 2004–2006 Postdoctoral Research Fellow, Gatsby Computational Neuroscience Unit, University College London (United Kingdom), advisor: Peter Dayan

Grants

- 2008–2011 Wellcome Trust project grant, *Spike timing-based memory in the hippocampus*, £150,000 with Peter Dayan (University College London, United Kingdom) and Ole Paulsen (University of Oxford, United Kingdom)
- 2006–2007 NWO – British Council Partnership Programme in Science with Francesco Battaglia (University of Amsterdam, The Netherlands)
- 2006 British Council Franco-British Alliance Programme with Peter Dayan (University College London, United Kingdom) and Boris Gutkin (École Normale Supérieure, France)

EDUCATION

- 2000–2003 Ph.D., Behavioral Neuroscience Program, Doctoral School of Biology, Faculty of Sciences, Eötvös Loránd University (Budapest, Hungary), advisor: Péter Érdi
- 1993–2000 M.Sc., Cell, Developmental and Neurobiology, Faculty of Sciences, Eötvös Loránd University (Budapest, Hungary), advisor: Péter Érdi

Other training

- 2002, EU Marie Curie Visiting Student: SISSA International School for Advanced Studies
2003 (Trieste, Italy)
4+4 months, advisor: Alessandro Treves
- 2001 IBRO EU Advanced Course on Computational Neuroscience (Trieste, Italy), 4 weeks

AWARDS

- 2000–2001 Distinguished Student of the Faculty Award, Eötvös Loránd University (Budapest, Hungary)
- 1999–2000 Scholarship of the Republic of Hungary
- 1999 2nd prize, National Scientific Competition, Neurobiology II, Hungary
- 1998 1st prize, University Scientific Competition, Neurobiology, Eötvös Loránd University (Budapest, Hungary)

Other scholarships

- 2003 full scholarship for the 6th IBRO World Congress of Neuroscience (Prague, Czech Republic)
- 2002 full scholarship for the 6th International Conference on Cognitive and Neural Systems (Boston, USA)
- 2001 full scholarship for the IBRO EU Advanced Course on Computational Neuroscience (Trieste, Italy)

TEACHING EXPERIENCE

- 2008– regular teaching and examining, Department of Engineering, University of Cambridge (United Kingdom)
Mathematical Physiology (4 hours / year)
Introduction to Neuroscience (8 hours / year)
Computational Neuroscience (10-12 hours / year + course organiser)
1st Year Exposition (14 hours / year, only 2008–2009)
- 2010 lecturer, *Belief and decisions* school, Central European University (Budapest, Hungary)
Normative approaches to learning, memory, and decision making (4 hours)
- lecturer, *FENS / IBRO summer school on Cognition and Action* (Dubrovnik, Croatia)
Episodic memory: why and how – or the powers and perils of Bayesian inference in the brain (1 hour)
- lecturer, *Ararat school on memory* (Yerevan, Armenia)
Computational approaches to learning and memory (3 hours)
- lecturer, *Mathematical approaches to biology* course, University of Cambridge (United Kingdom)
The computational neuroscience of memories (1 hour)

- 2009 lecturer, *Memory and mind* school, Central European University (Budapest, Hungary)
Probabilistic models of learning and memory (4 hours)
- 2007 lecturer, Budapest Semester in Cognitive Sciences, Eötvös Loránd University (Budapest, Hungary)
Selected Topics in Computational Neuroscience (10 hours)
- 2006 guest lecturer, *Theoretical Neuroscience* course, Gatsby Computational Neuroscience Unit, University College London (United Kingdom)
Space and memory in the hippocampus (4 hours)
- 2005 lecturer, *Neuroplasticity School*, London, United Kingdom
Computational approaches to memory storage and retrieval in neural networks (2 hours)
- 2005 guest lecturer, *Theoretical Neuroscience* course, Gatsby Computational Neuroscience Unit, University College London (United Kingdom)
Theta oscillations and temporal coding in the hippocampus (2 hours)
- 2004 guest lecturer, *Topics in Neurobiology* course, University College London (United Kingdom)
Autoassociative memory in the hippocampus (2 hours)
- 2002–2003 graduate lecturer, Faculty of Sciences, Eötvös Loránd University (Budapest, Hungary)
Computational Neuroscience (10 hours)
- 2002 teaching assistant, Center for Complex Systems Studies, Kalamazoo College (USA)
Computational Neuroscience (3 hours + coursework supervisions)
- 1999 tutor, Romaversitas Invisible College, Roma Civil Rights' Foundation (Budapest, Hungary)
- 1998–2001 teaching assistant, Faculty of Sciences, Eötvös Loránd University (Budapest, Hungary)
Computational Neuroscience (3 hours)
- 1996 lecturer, John Wesley Theological College (Budapest Hungary)
Computer Skills (20 hours)
- 1994 teacher, Berzsényi Dániel High School (Budapest, Hungary)
Computer Programming (32 hours)

Students, postdocs supervised

- 2010– Cristina Savin, postdoc
- 2010– Neil Houlsby, PhD
- 2008–2010 Jean-Pascal Pfister, postdoc
- 2008–2010 Neil Houlsby, MEng
- 2009–2010 Douglas Orr, MEng
- 2009–2010 Mark Ioffe, MSci
- 2009–2010 Robin Brown, MSci
- 2008–2009 Jacqui Jeffery, MEng
- 2008–2009 Yi Han, MEng

2007–2009 Ferenc Huszár, MSc (externally supervised)
2006–2008 Gergő Orbán, postdoc (co-supervised)
2001–2005 Zsófia Huhn, MSc (co-supervised)
2001–2003 Gergely Papp, Msc (co-supervised)
2000–2001 Fanni Misják, MSc (co-supervised)
1998–2000 Gergő Orbán, Msc (co-supervised)
1998–2000 Tamás Kiss, MSc (co-supervised)

OTHER PROFESSIONAL ACTIVITIES

Invited professorships

2010 École Normale Supérieure (1 month)

Editorships, memberships in advisory bodies

2010– Neural Information Processing Systems (area chair)

Peer review activities

grants:

European Research Council
Medical Research Council
Swiss National Science Foundation

journals:

Behavioral and Brain Sciences	Nature Neuroscience
Brain Research	Neural Computation
Cognition	Network: Computation in Neural Systems
European Journal of Neuroscience	Philosophical Transactions of the Royal Society B
Frontiers in Computational Neuroscience	Biological Sciences
Frontiers in Synaptic Neuroscience	Physics Letters A
Hippocampus	PLoS Computational Biology
IEEE Transactions on Neural Networks	Science
Journal of Computational Neuroscience	Trends in Cognitive Sciences
Journal of Neurophysiology	Vision Research

books:

‘Phase Response Curves in Neuroscience’

peer-reviewed conferences:

Computational and Systems Neuroscience
Neural Information Processing Systems

Organisation

- 2010 summer school on *Belief and decisions: of minds and machines* (Central European University, Budapest, Hungary)
Cosyne workshop on *The Sampling Hypothesis* (Snowbird, USA)
co-organisers: Pietro Berkes, József Fiser
- 2009 NIPS workshop on *Normative Electrophysiology* (Whistler, Canada)
co-organiser: Jean-Pascal Pfister
- 2008– Computational Neuroscience Journal Club (Department of Engineering, University of Cambridge, United Kingdom)
co-organiser: Jean-Pascal Pfister, Cristina Savin
- 2008 PGCN course and workshop on *Hippocampus and Navigation* (Gulbenkian Institute, Oeiras, Portugal)
co-organiser: Miguel Remondes
- 2007 workshop on *Statistical Inference in the Visual Cortex* (Collegium Budapest Institute for Advanced Study, Budapest, Hungary)
co-organiser: József Fiser
- 2007 Budapest Computational Neuroscience Forum (Collegium Budapest Institute for Advanced Study, Budapest, Hungary)
- 2006 Cosyne workshop on *Computing with Spikes* (Salt Lake City, USA)
co-organisers: Sophie Denève, Boris Gutkin

Professional memberships

- 2004– Society for Neuroscience
- 2000– Hungarian Neuroscience Society

INVITED PRESENTATIONS

- 2011 *Useful variability in the nervous system: spontaneous activity and short-term synaptic plasticity*
host: Norbert Hájos (Institute for Experimental Medicine, Hungarian Academy of Sciences, Budapest, Hungary)
- 2010 *The problem annihilation principle*
host: Péter Érdi (KFKI Res Inst for Particle and Nuclear Physics, Hungarian Academy of Sciences, Budapest, Hungary)
- Single cell computations: smarter than you think, dumber than you hope*
host: József Fiser (Volen National Center for Complex Systems, Brandeis University, Waltham, USA)
- Mind reading by machine learning: a doubly Bayesian method for inferring mental representations.*
host: John Rust (Psychometrics Centre, University of Cambridge, United Kingdom)
- Learning and memory: the powers and perils of Bayesian inference*
host: Gergely Csibra (Cognitive Science Center, Central European University, Budapest, Hungary)
- Synapses with short-term plasticity are optimal estimators of presynaptic membrane potentials*
host: Boris Gutkin (Group for Neural Theory, École Normale Supérieure, Paris, France)
- keynote: *Normative approaches to theoretical neuroscience: from behaviour to neurophysiology*
MRC Anatomical Neuropharmacology Unit Science Day (Craig y Nos, United Kingdom), host: Peter Somogyi
- discussant, Gatsby workshop on *Grid Cells: Formation and Function* (Gatsby Computational Neuroscience Unit, University College London, United Kingdom), organisers: Caswell Barry, Neil Burgess
- Normative neurophysiology: “matching laws” for neurons*
Neuroscience Symposium “From Molecules to Code” (IST Austria, Vienna, Austria), organiser: Peter Jonas
- Why remember? Episodic versus semantic memories for optimal decision making*
Neurocomp Marseille (Marseilles, France), organiser: Andrea Brovelli
- Single cell computations: smarter than you think, dumber than you hope*
host: Peter Latham (Gatsby Computational Neuroscience Unit, University College London, United Kingdom)
- Back to the future: memories for making predictions and decisions*
host: Eddy Davelaar (Department of Psychological Sciences, Birkbeck College, London, United Kingdom)
- Spontaneous activity reveals statistically optimal internal models in the visual cortex*
Ararat workshop on memory (Yerevan, Armenia), organiser: Alessandro Treves
- 2009 discussant, NIPS workshop on *Bounded-rational analyses of human cognition: Bayesian models, approximate inference, and the brain* (Whistler, Canada), organisers: Noah Goodman, Edward Vul, Tom Griffiths, Josh Tenenbaum
- Episodic memory: why and how?*
Bernstein Conference on Computational Neuroscience, Student Symposium (Frankfurt Institute for Advanced Studies, Germany)

- Self-organisation with a purpose: how the brain develops internal models of the world*
Biowire09 symposium (Computer Laboratory, University of Cambridge, United Kingdom), organiser: Pietro Lio
- Statistically optimal internal models in visual perception: behavioural and neural evidence*
host: Peggy Seriès (Institute for Adaptive and Neural Computation, University of Edinburgh, United Kingdom)
- Normative models of multiple interacting memory systems*
host: Anthony Dickinson (Department of Experimental Psychology, University of Cambridge, United Kingdom)
- Back to the future: memories for making predictions and decisions*
host: John Duncan (MRC Cognition and Brain Unit, Cambridge, United Kingdom)
- 2008 *Normative models of multiple interacting memory systems*
NIPS workshop on *Machine Learning Meets Human Learning* (Whistler, Canada), organisers: Nathaniel Daw, Tom Griffiths, Josh Tenenbaum, Xiaojin Zhu
- Normative models of learning and memory*
host: Wulfram Gerstner (Ecole Polytechnique Fédérale de Lausanne, Lausanne, Switzerland)
- Learning and memory in neural networks: statistically optimal computations*
symposium on *Networks and Neuroscience* (University of Cambridge, United Kingdom)
- Computational approaches to hippocampal-neocortical interactions: consolidation, replay, and more*
FENS symposium on *Sleep, off-line reactivation and memory consolidation* (Geneva, Switzerland), organiser: Cyriel Pennartz
- Biological learning and memory from a theoretical perspective*
Fourth Annual Symposium of the Cambridge Computational Biology Institute (University of Cambridge, United Kingdom), organiser: Gos Micklem
- Memory=storing associations between elements? Insights from a normative perspective*
symposium on *Horizon: The Thinking Machine?* (University of Cambridge, United Kingdom)
- Bayesian learning of visual chunks by human observers*
host: David MacKay (Inference Group, Cavendish Laboratory, University of Cambridge, United Kingdom)
- 2007 *Emergent memories: matching storage and recall*
fellow seminar in Collegium Budapest Institute for Advanced Study (Budapest, Hungary)
- Bayesian ideal learning in human visual scene perception*
host: Eero Simoncelli (New York University, USA)
- 2006 *Uncertainty, phase and oscillatory hippocampal recall*
CNS workshop on *Functional Models of the Hippocampal Formation* (Edinburgh, United Kingdom), organiser: Laurenz Wiscott
- Matching storage and recall: spike timing-dependent plasticity and phase response curves in the hippocampus*
CNS workshop on *Phase Response Curves: Where Theory and Experiments Intersect* (Edinburgh, United Kingdom), organisers: Tay Nettof, Horacio Rotstein

- Firing rates and times in the hippocampus: what are they good for?*
 École Normale Supérieure/University College London workshop on *Computational Neuroscience: From Biophysics to Computation and Back* (Paris, France), organisers: Sophie Deneve, Boris Gutkin
- Firing rates and times in the hippocampus: what are they good for?*
 workshop on *Hippocampal Interactions Within the Medial Temporal Lobe* (University College London, United Kingdom), organiser: Kate Jeffery
- Firing rates and times in the hippocampus: what are they good for?*
 host: Francesco Battaglia (University of Amsterdam, The Netherlands)
- Firing rates and times in the hippocampus: what are they good for?*
Bayesian model learning in human visual perception
 host: Fritz Sommer (University of California, Berkeley, USA)
- Firing rates and times in the hippocampus: what are they good for?*
 host: Ildikó Aradi (Northwestern University, Chicago, USA)
- Bayesian model learning in human visual perception*
 host: Richard Aslin (University of Rochester, USA)
- Bayesian model learning in human visual perception*
 host: Rich Zemel (University of Toronto, Canada)
- In search of lost time: spike timing-dependent memories in the hippocampus*
 host: Szabolcs Káli (Institute for Experimental Medicine, Hungarian Academy of Sciences, Budapest, Hungary)
- Firing rates and phases in the hippocampus: what are they good for?*
 host: Péter Érdi (KFKI Res Inst for Particle and Nuclear Physics, Hungarian Academy of Sciences, Budapest, Hungary)
- 2005 *Matching storage and recall: spike timing-dependent memories in the hippocampus*
 host: József Fiser (Volen National Center for Complex Systems, Brandeis University, Waltham, USA)
- Dynamically detuned oscillations account for rate and phase coding in the hippocampus*
 host: Francesco Battaglia (CNRS, Paris, France)
- 2004 *Matching storage and recall: constructing optimal rate- and phase-coded autoassociative memories*
 host: Ole Paulsen (University of Oxford, United Kingdom)
- Dynamically detuned oscillations account for rate and phase coding in the hippocampus*
 host: Michael Hausser (University College London, United Kingdom)
- Dynamically detuned oscillations account for rate and phase coding in the hippocampus*
 workshop on *Theta Oscillations in the Brain: Neural Mechanisms and Functions*
 (University College London, United Kingdom), organisers: Neil Burgess, John O'Keefe