

Daniel HILLIER

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PROFESSIONAL EXPERIENCE

2018- Group leader – Research Centre for Natural Sciences, Hungarian Academy of Sciences, Hungary
2018- Assistant Professor – Faculty of Information Technology, Pazmany Peter University, Hungary
2016-2018 Scientific advisor – Translating virus-based circuit modulation and activity recording to the visual system of cats – Research Centre for Natural Sciences, Hungarian Academy of Sciences, Hungary
2006 Visiting scholar, Real-time vision algorithms – Manchester Institute of Technology, UK
2005-2006 Visiting scholar, Synchronization in oscillator arrays – Katholieke Universiteit Leuven, Belgium
2005 Visiting scholar, Classification of retinal cells – Friedrich Miescher Institute, Switzerland
2004 Visiting scholar, Morphology analysis of retinal ganglion cells – Harvard Medical School, USA
2002-2004 Research fellow, Tracking the endocardium on echocardiograms – MTA-SZTAKI, Hungary
2000-2001 Undergraduate researcher, fMRI signal analysis – Free University of Brussels, Belgium

EDUCATION

2008-2018 Postdoctoral fellow – Genetically targeted interrogation of cortical computations in the visual cortex of mice – Friedrich Miescher Institute for Biomedical Research, Switzerland
2003-2008 PhD Student – Retina-inspired machine vision – Pázmány Péter Catholic University, Faculty of Information Technology, Hungary
1998-2002 Master studies – Interactive Telecommunication, Digital Signal Processing – Technical University of Budapest, Hungary

GRANTS

2018 NKFIH Young Investigator grant (120k EUR)
2018 Startup fund of NeuroPSI (300k EUR, declined)
2010-2011 EMBO Long-Term Fellowship (120k EUR)
2008-2010 Marie Curie Intra-European Fellowship (220k EUR)

AWARDS

2017 Chiquet-Ehrismann Prize
2006 Royal Society Short Visit Grant
2004 First prize at the annual evaluation of PhD students at the Computer and Automation Research Institute of the Hungarian Academy of Sciences
2001 First prize in the French language section and Special Prize of the Scientific vice-chancellor at the Scientific Conference of Students. Topic: Temporal characteristics of fMRI signals in the human brain
2000-2001 Fellowship of the Francophone University Agency at the Free University of Brussels, Belgium
1999-2000 Scholarship of the Hungarian Republic (Scholarship assigned to 0.6% of Hungarian students)
1998 Second prize in the French language section and Special Prize of the Scientific vice-chancellor at the Scientific Conference of Students at the TUB. Subject of the presentation: Psycho-acoustic Compression Methods

SELECTED PUBLICATIONS IN EXPERIMENTAL NEUROSCIENCE

D. Nelidova, C. Cowan, R. Morikawa, Z. Raics, D. Goldblum, H. Scholl, T. Szikra, A. Szabo, **D. Hillier***, **B. Roska***, Restoring vision using tunable near-infrared sensors, **Science**, accepted for publication (2020) *:co-corresponding authors.

B. Barsy, K. Kocsis, A. Magyar, Á. Babiczky, M. Szabó, J. M. Veres, **D. Hillier**, I. Ulbert, O. Yizhar, F. Mátyás, Plastic and multimodal thalamic signaling to the lateral amygdala controls associative behavior, **Nature Neuroscience**, <https://doi.org/10.1038/s41593-020-0620-z> (2020)

F. F. Voigt, D. Kirschenbaum, E. Platonova, S. Pagès, R. Campbell, R. Kastli, M. Schaettin, L. Egolf, A. Van Der Bourg, P. Bethge, K. Haenraets, N. Frézel, T. Topilko, P. Perin, **D. Hillier**, S. Hildebrand, A. Schueth, A. Roebroeck, B. Roska, E. Stoeckli, R. Pizzala, N. Renier, H. Zeilhofer, T. Karayannis, U. Ziegler, L. Batti, A. Holtmaat, C. Lüscher, A. Aguzzi, F. f Helmchen, The mesoSPIM initiative: open-source light-sheet microscopes for imaging cleared tissue, **Nature Methods**, 16(11):1105-1108 (2019)

A. Drinnenberg, F. Franke, R Morikawa, J. Juettner, **D. Hillier**, P. Hantz, A. Hierlemann, R. da Silveira, B. Roska, How Diverse Retinal Functions Arise from Feedback at the First Visual Synapse, **Neuron**, 99(1):117-134 (2018)

R Schubert, S Trenholm, K Balint, G Kosche, C S Cowan, M A Mohr, M Munz, D Martinez-Martin, G Flaeschner, R Newton, K Yonehara, A Wertz, A Ponti, A Ghanem, **D Hillier**, KK Conzelmann, Daniel J. Müller, B Roska, Virus stamping for targeted single cell infection in vitro and in vivo, **Nature Biotechnology**, 36(1):81-88. (2018)

D Hillier, M Fiscella, A Drinnenberg, S Trenholm, S Rompani, Z Raics, G Katona, J Juettner, A Hierlemann, B Rózsa, Botond Roska, Causal evidence for retina-dependent and -independent visual motion computation in the mouse cortex, **Nature Neuroscience** 20, 960-968 (2017)

Highlighted in News & Views, **Nature Neuroscience** 20, 899-901 (2017)

Reviewed in Dispatch, **Current Biology** 27, 710-713 (2017)

A Wertz, S Trenholm, K Yonehara, **D Hillier**, Z Raics, M Leinweber, G Szalay, A Ghanem, G Keller, B Rózsa, KK Conzelmann, Botond Roska, Single-cell-initiated monosynaptic tracing reveals layer-specific cortical network modules, **Science** 349 (6243), 70-74 (2015)

G Katona, G Szalay, P Maák, A Kaszás, M Veress, **D Hillier**, B Chiovini, ES Vizi, B Roska, B Rózsa, Fast two-photon in vivo imaging with three-dimensional random-access scanning in large tissue volumes, **Nature Methods** 9 (2), 201-208 (2012)

SELECTED PUBLICATIONS IN COMPUTER SCIENCE

A Horvath, **D Hillier**, Topographic metrics for image segmentation, Proc. IEEE Int. Conf. On Cellular Nanoscale Networks and its Applications (2010)

D Hillier, Z Czeilinger, A Vobornik, C Rekeczky, Online 3-D reconstruction of the right atrium from echocardiography data via a topographic cellular contour extraction algorithm, **IEEE Transactions on Biomedical Engineering** 57 (2), 384-396 (2010)

D Hillier, S Günel, JAK Suykens, J Vandewalle, Partial synchronization in oscillator arrays with asymmetric coupling, **International Journal of Bifurcation and Chaos** 17 (11), 4177-4185 (2007)

D Hillier, V Binzberger, DL Vilarino, Cs Rekeczky, Topographic cellular active contour techniques: Theory, implementations and comparisons, **Int. J. of Circuit Theory and Appl.**, Vol. 34., No. 2., pp 183-216 (2006)

WORK IN PROGRESS

G Szalay*, **D Hillier***, M Veress, G Katona, B Rozsa, Simultaneous random-access imaging of the mouse cortex across the full cortical column, In preparation, * equal contributions

S Trenholm, A Wertz, **D Hillier**, K Yonehara, B Roska, Functional specializations of layer 4 cortical networks in mouse visual cortex, In preparation

INVITED TALKS

2019 Festival of Hungarian Science, Budapest, Hungary
2019 Institute for the Blind, Budapest, Hungary
2018 CNRS, Paris, France
2017 Neuro-PSI, Université Paris-Sud, France
2017 FENS-IBRO Regional Meeting, Pecs, Hungary
2016 Institute of Experimental Medicine, Budapest, Hungary
2015 Two-photon technology workshop, Vienna, Austria

2015 Roska Tamas memorial symposium, Budapest, Hungary
2014 Nanosymposium, Society for Neuroscience, Washington DC, USA
2014 Kavli Institute – FMI Neuroscience meeting, Rungstedgaard, Denmark
2014 FENS-IBRO Neurophotonics Workshop, Debrecen, Hungary
2007 SynCoNet Workshop, Leuven, Belgium

LANGUAGES

Hungarian : Mother tongue
English, German, French : Fluent