CURRICULUM VITAE **MARTHA NARI HAVENITH** PHD | Nov 2019

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Research Statement

Unlike in, say, *C. Elegans*, in mammals the conversion from sensory input to motor output follows a complex and flexible path, shaped by a multitude of interacting cognitive processes. As such, most neuronal and even behavioural responses are in fact not directly linked to external events, but internally generated and referenced. I have studied such internally driven dynamics combining a range of techniques from acute and chronic electrophysiology to two-photon imaging and optogenetics, mouse behaviour and extensive data mining of neuronal and behavioural data.

With these tools, I have demonstrated that internally-timed spike sequences encode precise visual information in cats, that trial-by-trial correlations between neuronal responses and task performance predict learning in mice better than averaged metrics, and I have most recently created a task for mice that tracks trial-by-trial changes in visual decision making, attention and rule learning. Among other insights, this has highlighted the fact that rule execution is a weak predictor of rule learning in mice, since rule learning precedes rule execution by a large, and individually variable, time delay.

Academic Positions and Education

2019 - present	Max Planck Research Group Leader Ernst-Strüngmann Institute for Neuroscience
2018 - present	Co-founder of 3DNeuro BV – A Donders spin-off company providing 3D-printed equipment for electrophysiology
2013 - 2019	Postdoctoral research associate with Paul Tiesinga and Jeffrey Glennon Project: *Micro-circuit dynamics of visual attention and learning in mice* Donders Institute for Brain, Cognition and Behaviour, Nijmegen, Netherlands
2009 - 2013	Royal Society Newton postdoctoral fellow with Michael Hausser Project: *Mouse visual cortex mediates task acquisition, but not execution* University College London, London, United Kingdom
2005 - 2009	Ph.D. in Neurophysiology with Wolf Singer and Danko Nikolic Graduated summa cum laude Thesis title: *A matter of time: Millisecond delays between action potentials convey stimulus information in cat primary visual cortex* Max Planck Institute for Brain Research, Frankfurt, Germany
2004 - 2005	M.Sc. in Neuroscience Graduated cum laude, including experimental theses on • *Regeneration of implanted retina cells in mice* • *Effect of sub-threshold input on hippocampal spike timing* Oxford University, Oxford, United Kingdom

2002 - 2004	Research assistant with Lars Muckli and Danko Nikolic Max Planck Institute for Brain Research, Frankfurt, Germany
2001 - 2002	Research assistant with Tilmann Habermas J.W. Goethe University, Frankfurt, Germany
2000 - 2004	B.Sc. in Psychology (with minor in Mathematics) Graduated summa cum laude J.W. Goethe University, Frankfurt, Germany

Research Grants and Scholarships

2016 - present	Ph.D. funding for S. v. Heukelum (Donders TOPtalent grant)	€ 240,000
2009 - 2012	Newton International Fellowship by the Royal Society	£ 90,000
2005 - 2008	3-year Ph.D. fellowship by the Ernst Schering Foundation	€ 85,000
2001 – 2006	Scholarship by the German National Academic Foundation	€ 110,000
2004 – 2005	International scholarship by the German National Academic Foundation	£ 18,000
2004 – 2005	Funding of Oxford University fees by the Medical Research Council	£ 11,000

Honours and Awards

2012	Research prize by the Neuroscience Exchange Meeting of Max Planck Society and Centre National de la Recherche Scientifique
2011	SfN Poster Prize by the Korean Neuroscience Society
2008	Young Investigator Award by the NeuroWiss Foundation

Teaching, Courses and Outreach

2016 – 2018	One lecture + practical + exam per semester on behavioural paradigms, within the M.Sc. course on Methods in Neuroscience
2015 - 2018	Lab courses in mouse research for B.Sc. students in the Radboud Honors Program and the UMC-RU interfaculty course in Translational Neuroscience
2017	Finalist in the *'I'm a Scientist, get me out of here!'* initiative of the Wellcome Trust
2015	Speaker at the Radboud summer school 'Introduction to Cognitive Neuroscience'
2013 - 2015	Two lectures per semester on optogenetics, within the M.Sc. course on Methods in Neuroscience
2013	Speaker at the Donders summer school 'Brain Networks and Neuronal Communication' Public talk at the Biotechnology Meeting held by the Dutch Science Ministry
2011 – 2012	Co-organizer of the 'Vision Club' between the Hausser, Carandini - Harris and Mrsic-Flogel - Hofer labs
2008	Scholarship selection committee of the German National Academic Foundation Speaker at the summer school of the Frankfurt Institute for Advanced Studies
2007	Organised yearly retreat of Max Planck Institute for Brain Research
2002 - 2004	Teaching assistant for statistics, J.W. Goethe University, Frankfurt

Academic Supervision

2018 - present	Bas van Gorp, Ph.D.
2017 - present	Sabrina van Heukelum, Ph.D.
2015 – 2019	Peter Zijderveld, Ph.D.
2017	Bas van Gorp, M.Sc.
2016	Sabrina van Heukelum, M.Sc.
2015	Kim Fricke, M.Sc.
	Peter Zijderveld, M.Sc.
	Jan Maka, Summer rotation
2010 - 2015	Han Langeslag, Ph.D.
2014	Maud de Feijter, B.Sc.
2013	Francis Carpenter, M.Sc.
2012	Katharine Shapcott, M.Sc.
2008	Ajmal Zemmar, M.D.
	Vanja Kekanovic, M.Sc.
	Patrick Sproete, B.Sc.

Invited Talks

assistant professor / junior group position: * shortlisted, ** awaiting decision, *** job offer

2018	*** Ernst-Struengmann Institute, Frankfurt
	* Donders Centre for Cognitive Neuroimaging, Nijmegen
2016	Netherlands Institute for Neuroscience, Amsterdam
2015	Netherlands Institute for Neuroscience, Amsterdam
2014	Max Planck Institute for Neurobiology, Munich
	Centre de Recherche Cerveau et Cognition, CNRS, Toulouse
2013	Max Planck Institute for Brain Research Retreat, Schloss Ringberg
	FNWI, Radboud University, Nijmegen
2012	* Max Planck Institute for Brain Research, Frankfurt
	* FNWI, Radboud University, Nijmegen
	CNRS-MPG Neuroscience Exchange, Paris
2011	*Ernst Strüngmann Institute for Neuroscience, Frankfurt
	Technische Universität, Darmstadt
	Universiteit van Amsterdam, Amsterdam
2010	Redwood Centre for Theoretical Neuroscience, University of California, Berkeley
	FNWI, Radboud University, Nijmegen
	Centre for Neural Science, Korea Institute of Science and Technology
	Eye and Vision Laboratory, Seoul National University
2008	Eye and Vision Laboratory, Seoul National University
	Wolfson Institute for Biomedical Research, University College London
	Gatsby Unit, University College London
	Carl von Ossietzky University, Oldenburg
	Centre de Recherche Cerveau et Cognition, CNRS, Toulouse

Selected Conference Presentations

International

Optogenetics Meeting of the Netherlands Institute for Neuroscience: Amsterdam 2017
European Visual Cortex Meeting: 2015
SfN: San Diego 2013, Washington 2011, San Diego 2010, Washington 2008, San Diego 2007, Washington 2005, San Diego 2004
Physiological Society Meeting: Oxford 2011
Cosyne: Salt Lake City 2008

Local

Dutch Neuroscience Conference: Lunteren 2017, 2015, 2014
Donders Perception Day: Nijmegen 2016
FP7-TACTICS meeting: Fuerteventura 2016, Malta 2015
FP7-MATRICS meeting: Santpoort 2015
UCL Neuroscience Symposium: London 2012, 2011

Reviewer

Neuron
Journal of Neuroscience
eNeuro
Brain Research

Journal Publications

‡ indicates equal contribution
H-index: 6, citations: 315 (google scholar)

1. **Havenith MN**[‡], **Schölvinck ML**[‡]**,** Reid C, Hausser M, Tiesinga P[‡], Fries P[‡] (in preparation) The brain does not average: Testing the behavioural relevance of average neuronal responses in cats, mice and monkeys.
2. **Havenith MN**‡, Schroeder T‡, Franca ASC, Abghari S, Glennon JC, Battaglia F, Tiesinga P (in preparation) A surgical protocol for safe and efficient chronical implants of silicone probes in mouse cortex.
3. **Havenith MN**, Langeslag H, Carpenter F, Shapcott K, Tiesinga P, Häusser M (2018) The transient role of mouse visual cortex in visually guided behavior, **under review at Neuron**
4. van Heukelum S, Mars RB, Guthrie M, Tiesinga P, Buitelaar JK, Beckmann CF, Vogt BA, Glennon JC‡, **Havenith MN‡** (2019) Cingulate Cortex Revisited: Towards a Consistent Delineation of Anterior and Midcingulate Cortex Across Species, **under review at Nature Neuroscience**

5. van Heukelum S, Drost L, Mogavero F, Jager A, Glennon JC‡, **Havenith MN‡** (2019) Gradient of Parvalbumin- and Somatostatin-Expressing Interneurons Across Cingulate Cortex Is Differentially Linked to Aggression and Sociability in BALB/cJ Mice, **Frontiers Psychiatry**, 10: 809

6. **Havenith MN**, Zijderveld PM, van Heukelum S, Abghari S, Glennon JC, Tiesinga P (2019) The Virtual-Environment-Foraging Task enables rapid training and single-trial metrics of rule acquisition and reversal in head-fixed mice, **Nature Scientific Reports**, 9(1): 4790

7. van Heukelum S, Drost L, Mogavero F, Jager A, **Havenith MN‡**, Glennon JC‡ (2019) Aggression in BALB/cJ mice is differentially predicted by the volumes of Anterior and Mid-Cingulate Cortex, **Brain Structure and Function**, 224(3):1009-1019

8. Serretti A, Kozak R, Porcelli S, Arce E, Dukart J, Hayen A, Lobo A, Anton RL, Pich EM, Pemberton D, **Havenith MN**, Glennon JC, Marston H (2019) Quantitative and translational measures of attention in schizophrenia, Alzheimer's disease, and major depressive disorder, **Neuroscience & Biobehavioural Reviews**, 97:47-69

9. **Havenith MN‡**, Zijderveld PM‡, van Heukelum S, Abghari S, Tiesinga P, Glennon JC (2018) The Virtual-Environment-Foraging Task enables rapid training and single-trial metrics of attention in head-fixed mice, **Nature Scientific Reports**, 8(1): 17371

10. Kirkels LAMH, Zhang W, **Havenith MN**, Tiesinga P, Glennon JC, van Wezel RJA, Duijnhouwer J (2018) The opto-locomotor reflex as a tool to measure sensitivity to moving random dot patterns in mice, **Nature Scientific Reports**, 8 (2018) 7710

11. **Havenith MN**, Yu S, Biederlack J, Chen NH, Singer W, Nikolic D (2011) Synchrony makes neurons fire in sequence, and stimulus properties determine who is ahead, **Journal of Neuroscience**, 31: 8570-8584

12. Jurjut OF, Nikolic D, Singer W, Yu S, **Havenith MN**, Muresan RC (2011) Timescales of multineuronal activity patterns reflect temporal structure of visual stimuli, **PLoS One**, 6: e16758

13. Wang P, **Havenith MN**, Best M, Gruetzner C, Singer W, Uhlhaas P, Nikolic D (2010) Time delays in the beta/gamma cycle operate on the level of individual neurons, **Neuroreport**, 21: 746-750

14. Hahn G, Petermann T, **Havenith MN**, Yu S, Singer W, Plenz D, Nikolic D, Neuronal avalanches in spontaneous activity in vivo, **Journal of Neurophysiology**, 104: 3312-3322

15. Feng W, **Havenith MN**, Wang P, Singer W, Nikolic D (2010) Frequencies of gamma/beta oscillations are stably tuned to stimulus properties, **Neuroreport**, 21: 680-684

16. **Havenith MN**, Zemmar A, Yu S, Baudrexel SM, Singer W, Nikolic D (2009) Measuring sub-millisecond delays in spiking activity with millisecond time-bins, **Neuroscience Letters**, 450: 296-300

17. Schneider G, **Havenith MN**, Nikolic D (2006) Spatiotemporal structure in large neuronal networks detected from cross-correlation, **Neural Computation**, 18: 2387-2413

18. Naumer MJ, Petkova V, **Havenith MN**, Kohler A, Singer W, Muckli LF (2004) Paying attention to multisensory objects, **NeuroImage**, 22-2004