

**PERSONAL AND CONTACT INFORMATION**

Full name Eelke Spaak Born 2 December 1985  
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**ACADEMIC POSITIONS/EXPERIENCE**

- 2018 – now **Research fellow / Veni laureate**  
 Donders Institute, Radboud University Nijmegen, The Netherlands  
 Advisor: prof. dr. Floris de Lange  
 Veni project: “Consciousness in context: Disentangling the paradoxical effects of prior expectations on subjective visual experience”
- 2020 – now **Co-chair Radboud Young Academy**  
 Body of young academics who foster and promote interdisciplinarity and sustainable and open science, and consult the university board on academic policy
- 2020 – now **PyMC3 developer**  
 Member of the core team responsible for developing the PyMC3 software package for constructing and sampling from hierarchical Bayesian models in Python
- 2010 – now **FieldTrip developer**  
 Member of the core team responsible for developing the FieldTrip software package for analysis of electrophysiological data
- 2017 – 2019 **Junior Research Fellow**  
 New College, University of Oxford
- 2015 – 2018 **Postdoctoral research fellow**  
 University of Oxford; advisor: dr. Mark Stokes  
 Project: “Temporary connective architectures in mind and brain: The role of functional connectivity in working memory”
- 2006 – 2008 **Research assistant**  
 Supervisor: prof. dr. Anne Cutler  
 Max Planck Institute for Psycholinguistics, Nijmegen, The Netherlands

**DEGREES**

- 2010 – 2014 **PhD in Cognitive Neuroscience**  
 Donders Institute, Radboud University Nijmegen, The Netherlands  
 Supervisor: prof. dr. Ole Jensen  
 Thesis title: “On the role of alpha oscillations in structuring neural information processing”
- 2009 – 2010 **MSc in Philosophy**  
 University of Edinburgh, United Kingdom; supervisor: dr. Tom Roberts  
 Thesis title: “Why stuff is real” (on the ontological equivalence of the micro- and macrophysical worlds)
- 2007 – 2009 **MSc in Cognitive Neuroscience (*cum laude*)**  
 Radboud University Nijmegen, The Netherlands  
 Supervisors: prof. dr. Stan Gielen, dr. Magteld Zeitler  
 Thesis title: “Hippocampal theta modulation of neocortical spike times and gamma rhythm: A biophysical model study”
- 2005 – 2009 **BA in Philosophy (*bene meritum*)**  
 Radboud University Nijmegen, The Netherlands; supervisor: prof. dr. Marc Slors  
 Thesis title: “Interpreting causality” (on the metaphysical nature of causality and its relation to free will)

2003 – 2008 **BSc in Artificial Intelligence (*bene meritum*)**  
 Radboud University Nijmegen, The Netherlands; supervisor: dr. Pim Haselager  
 Thesis title: “From imitation to action understanding: On the evolution of mirror neurons”

## PEER-REVIEWED PUBLICATIONS

- Spaak, E.**, Peelen, M.V., & De Lange, F.P. (in press) Scene context impairs perception of semantically congruent objects. *Psychological Science*.
- Barne, L.C., Cravo, A.M., De Lange, F.P., & **Spaak, E.** (in press) Temporal prediction elicits rhythmic pre-activation of relevant sensory cortices. *European Journal of Neuroscience*.
- Bouwkamp, F.G., De Lange, F.P., & **Spaak, E.** (2021) No exploitation of temporal predictive context during visual search. *Royal Society Open Science*. 8(3). doi:10.1098/rsos.201565
- Van Es, M.W.J., Marshall, T.R., **Spaak, E.**, Jensen, O., & Schoffelen, J.-M. (2020) Phasic modulation of visual representations during sustained attention. *European Journal of Neuroscience*. doi:10.1111/ejn.15084
- Drijvers, L., Jensen, O., & **Spaak, E.** (2020) Rapid invisible frequency tagging reveals nonlinear integration of auditory and visual information. *Human Brain Mapping*. 42(4), 1138-1152. doi:10.1002/hbm.25282
- Fritsche, M., **Spaak, E.**, & De Lange, F.P. (2020). A Bayesian and efficient observer model explains concurrent attractive and repulsive history biases in visual perception. *eLife*. doi: 10.7554/eLife.55389.
- Tankelevitch, L., **Spaak, E.**, Rushworth, M.F.S., & Stokes, M.G. (2020). Previously reward-associated stimuli capture spatial attention in the absence of changes in the corresponding sensory representations as measured with MEG. *The Journal of Neuroscience*. 40(26), 5033-5050. doi: 10.1523/jneurosci.1172-19.2020.
- Manahova, M.E., **Spaak, E.**, & De Lange, F.P. (2020). Familiarity increases processing speed in the visual system. *Journal of Cognitive Neuroscience*. 32(4), 722-733. doi: 10.1162/jocn\_a\_01507.
- Spaak, E.** & De Lange, F.P. (2020) Hippocampal and prefrontal theta-band mechanisms underpin implicit spatial context learning. *The Journal of Neuroscience*. 40(1), 191-202. doi: 10.1523/jneurosci.1660-19.2019.
- Wasmuht, D.F., **Spaak, E.**, Buschman, T.J., Miller, E.K., & Stokes, M.G. (2018) Intrinsic neuronal dynamics predict distinct functional roles during working memory. *Nature Communications*. doi: 10.1038/s41467-018-05961-4.
- Spaak, E.**, Watanabe, K., Funahashi, S., & Stokes, M.G. (2017) Stable and dynamic coding for working memory in primate prefrontal cortex. *The Journal of Neuroscience*. 37(27), 6503-6516. doi:10.1523/jneurosci.3364-16.2017.
- Jensen, O., **Spaak, E.**, & Park, H. (2016) Discriminating valid from spurious indices of phase-amplitude coupling. *eNeuro*. 3(6). doi:10.1523/eneuro.0334-16.2016.
- Stokes, M.G. & **Spaak, E.** (2016) The importance of single-trial analyses in cognitive neuroscience. *Trends in Cognitive Sciences*. 20(7), 483-486, doi: 10.1016/j.tics.2016.05.008.
- Spaak, E.**, Fonken, Y., Jensen, O., & De Lange, F.P. (2016) The neural mechanisms of prediction in visual search. *Cerebral Cortex*. 26(11), 4327-4336, doi: 10.1093/cercor/bhv210.
- Stokes, M.G., Wolff, M.J., & **Spaak, E.** (2015) Decoding rich spatial information with high temporal resolution. *Trends in Cognitive Sciences*. 19(11), 636-638, doi:10.1016/j.tics.2015.08.016.
- Jensen, O., **Spaak, E.**, & Zumer, J.M. (2019/2014) Human brain oscillations: From physiological mechanisms to analysis and cognition. In Supek, S., & Aine, C.J. (Eds.), *Magneto-encephalography: From signals to dynamic cortical networks*. Berlin: Springer.
- Spaak, E.**, De Lange, F.P., & Jensen, O. (2014). Local entrainment of alpha oscillations by visual stimuli causes cyclic modulation of perception. *The Journal of Neuroscience*. 34(10), 3536-3544, doi:10.1523/jneurosci.4385-13.2014

- Spaak, E., Bonnefond, M., Maier, A., Leopold, D.A., & Jensen, O. (2012).** Layer-specific entrainment of gamma-band neural activity by the alpha rhythm in monkey visual cortex. *Current Biology*, 22(24), 2313–2318. doi: 10.1016/j.cub.2012.10.020
- Spaak, E., Zeitler, M., & Gielen, C.C.A.M. (2012).** Hippocampal theta modulation of neocortical spike times and gamma rhythm: A biophysical model study. *PLoS ONE*, 7(10): e45688. doi:10.1371/journal.pone.0045688
- Spaak, E. (2009).** No one is tricking anyone: A critique of Wegner's theory of conscious will. *Splijstof*, 37(3), 15–26.
- Spaak, E. & Haselager, P.F.G. (2008).** Imitation and mirror neurons: An evolutionary robotics model. In A. Nijholt, M. Pantic, M. Poel, & H. Hondorp (Eds.) *Proceedings of BNAIC 2008, the Twentieth Belgian-Dutch Artificial Intelligence Conference*. (pp. 249–256). Enschede: University of Twente.

## **GRANTS AND AWARDS**

- 2018 – 2021 VENI fellowship, Netherlands Organisation for Scientific Research (NWO)
- 2017 – 2019 Junior Research Fellowship, New College, Oxford
- 2017 Postdoctoral Fellow Award, Cognitive Neuroscience Society
- 2016 nVidia Academic Hardware Grant
- 2015, 2017 Guarantors of Brain Travel Grant (2x)
- 2012, 2013 Radboud University Internationalization Grant (2x)
- 2009 – 2010 Huygens Talent Programme (HSP) Grant
- 2009 – 2010 VSBfonds scholarship

## **SELECTED PRESENTATIONS**

- 2020 *Hippocampal and prefrontal theta-band mechanisms underpin implicit spatial context learning*. eLife Early Career Researcher online talk.
- 2019 *Implicit context learning in hippocampus and prefrontal cortex*. Free University Amsterdam. [invited talk]  
*Implicit context learning in hippocampus and prefrontal cortex*. Brain & Cognition Meeting, University of Amsterdam. [invited talk]
- 2017 *Rapid synaptic plasticity as a substrate for working memory maintenance*. Cognitive Neuroscience Society, San Diego, USA. [postdoctoral fellow award poster]  
*Rapid synaptic plasticity as a substrate for working memory maintenance*. School of Psychology, University of Birmingham. [invited talk]
- 2016 *The neural basis of dynamic coding during a spatial working memory task*. Society for Neuroscience (SfN), San Diego, USA. [symposium speaker]  
*Stable and dynamic coding for working memory in primate prefrontal cortex*. International Conference on Biomagnetism (BioMAG), Seoul, South Korea. [symposium speaker, organizer, and chair]  
*Multivariate analyses of primate prefrontal cortex activity reveal simultaneously stable and dynamic coding for working memory*. Cognitive Neuroscience Society (CNS), New York, USA. [poster]
- 2015 *Stable and dynamic coding for working memory in primate prefrontal cortex*. Society for Neuroscience (SfN), Chicago, USA. [poster]
- 2014 *Phase coding in the visual system & Sensorimotor predictions during resumed visual search* Oxford Centre for Human Brain Activity, University of Oxford. [invited talk]
- 2013 *Phase coding in the visual system*. NeuroSpin Center, Université Paris-Saclay. [invited talk]

- Phase coding in the visual system.* Institut du Cerveau et de la Moelle Épineuse, Paris, France. [invited talk]
- Entrainment of alpha oscillations by visual stimuli and its effect on perception.* Philips Research, Eindhoven, The Netherlands. [invited talk]
- 2012 Participation in *The Cultural Meaning of the Natural Sciences*, Royal Dutch Academy of Sciences. With philosopher Prof Daniel Dennett, in honour of his receiving the Erasmus Prize from HRH Prince Willem-Alexander. [**all-day 'inner circle' panelist**]
- Layer-specific entrainment of gamma field potential power by alpha rhythm in the monkey visual cortex.* International Conference on Biomagnetism (BioMAG), Paris, France. [poster]
- Layer-specific entrainment of gamma-range band neural activity by the alpha rhythm in the monkey visual cortex.* Society for Neuroscience (SfN), New Orleans, USA. [poster]
- 2011 *Cross-laminar cross-frequency interactions in Monkey V1.* Champalimaud Neuroscience Symposium, Lisbon, Portugal. [poster]
- 2008 *From imitation to action understanding: On the evolution of mirror neurons.* European Society for Philosophy and Psychology, Utrecht, The Netherlands.

## **TEACHING EXPERIENCE**

- 2011 - 2019 **Lecturer and tutorial supervisor** at the 'Toolkit for Cognitive Neuroscience', a course on MEG/EEG advanced data analysis at the DCCN
- 2015 - 2017 **Tutor** in the course 'Advanced Option: Working Memory' at the Department of Experimental Psychology, University of Oxford.
- 2015 Obtained **qualification: Teaching and Learning Part 1** at the University of Oxford
- 2011 - ongoing **(Co-)supervision** of several MSc and PhD students
- 2013 - 2015 **Lecturer** in the course 'Cognitive Neuroimaging and Neuroscience' for third-year Biology students at the Radboud University Nijmegen
- 2012 - ongoing Several **FieldTrip data analysis workshops** (Max Planck Institute for Human Brain and Cognitive Sciences, Leipzig; Eberhard-Karls University Tübingen; Zürich University; King's College London; University of Exeter); **invited speaker and organizer**

## **ORGANIZATIONAL EXPERIENCE**

- 2021 Member of formal (6-year interval) **visitation committee** Radboud University IT services and university library
- 2020 - now **Co-chair** of Radboud Young Academy
- 2019 - 2021 **city coordinator Pint of Science**, international popular science festival.
- 2019 - 2021 **Postdoc/early career researcher representative** at the Donders Centre for Cognitive Neuroimaging (DCCN).
- 2012 - 2015 **Founder and co-chair of the Foundations meeting** at the DCCN, discussing theoretical and philosophical perspectives on neuroscience
- 2010 - 2013 **Chair of the Electrophysiological Data Analysis meetings** at the DCCN
- 2011 - 2013 **PhD representative** at the DCCN
- 2011 - 2013 **Member and chair** of the DCCN **board of representatives** for staff
- 2006 - 2008 **Faculty Student Council** of the Faculty of Philosophy at the RU Nijmegen
- 2006 - 2007 **Educational Committee**, Department of Artificial Intelligence, RU Nijmegen

2004 – 2005      **Organisation of BNAIS, an international student symposium** on artificial intelligence

### **OTHER PROFESSIONAL EXPERIENCE**

2008 – 2019      Co-owner at Spaak & Van Caspel Internet Presence, a small business dedicated to designing, developing and maintaining professional (e-commerce) websites

(ongoing)        Contributions to various open source software projects, most notably FieldTrip and PyMC3 (see also 'academic experience' at the top of this document)