

# Janneke F.M. Jehee

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## *Principal Investigator*

Center for Cognitive Neuroimaging, Donders Institute for Brain, Cognition and Behavior

Radboud University

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Github: <https://github.com/jeheelab>

## **Academic Positions**

2017-present Principal Investigator (tenured), Center for Cognitive Neuroimaging, Donders Institute for Brain, Cognition and Behavior, Nijmegen, Netherlands

2010-2016 Tenure-track Principal Investigator, Center for Cognitive Neuroimaging, Donders Institute for Brain, Cognition and Behavior, Nijmegen, Netherlands

2007-2010 Postdoctoral Fellow, Department of Psychology, Vanderbilt University, TN

2005-2007 Postdoctoral Fellow, Center for Visual Science and Department of Computer Science, University of Rochester, NY

## **Education**

2006 Ph.D. in Psychology, University of Amsterdam, Netherlands

2000 M.A. in Psychology, University of Amsterdam, Netherlands

## **Grants and Fellowships**

2023-2027 MSCA Doctoral Networks Grant, Horizon Europe (grant number 101119647, Role: PI, coordinator, €2,745,785)

2016-2022 ERC Starting Grant, European Research Council (grant number 677601, Role: PI, €1,500,000)

2016-2019 ALW Open Competition Grant, Netherlands Organization for Scientific Research (NWO) (grant number 824.15.016, Role: PI, €262,663; declined to accept ERC Starting Grant)

2014-2018 Marie Curie FP7-PEOPLE-2013-ITN Innovative Doctoral Program (IDP) grant, European Union (grant number 604063, Role: co-PI, together with 10 others, €3,349,230)

2010-2014 Marie Curie International Re-integration Grant, European Union (grant number 256456, Role: PI, €100,000)

2007-2009 Postdoctoral research fellowship, Netherlands Organization for Scientific Research (NWO) (grant number 446-06-030, Role: PI, €67,620)

2004 National Computer Facilities (NCF) grant, Netherlands Organization for Scientific Research (Role: co-author, together with HPC support center SARA, Amsterdam, Netherlands, €20,600)

## **Honors and Awards**

2018 Vanderbilt University Early Career Award.

2017 Vision Sciences Society (VSS) Young Investigator Award.

2006 Travel award, Marine Biological Laboratory, Woods Hole, MA

2004 Travel award, International Conference on Cognitive and Neural Systems, Boston University, Boston, MA

2003 Travel award for a 2-month visit to Gustavo Deco's lab (in Barcelona, Spain), Department of Psychology, Amsterdam University, Netherlands

## **Publications**

- Geurts, L.S., Ling, S., & **Jehee**, J.F.M. (submitted). Pupil-linked arousal modulates precision of stimulus representation in cortex.
- van Bergen, R.S., & **Jehee**, J.F.M. (preprint). TAFKAP: An improved method for probabilistic decoding of cortical activity. *bioRxiv*. doi:10.1101/2021.03.04.433946
- Rahnev, D., Block, N., Denison, R., & **Jehee**, J.F.M. (preprint). Is perception probabilistic? Clarifying the definitions. *PsyArXiv*. doi:10.31234/osf.io/f8v5r
- Takashima, A., Carota, F., Schoots, V., Redmann, A., **Jehee**, J.F.M., & Indefrey, P. (2024). Tomatoes are red: The perception of achromatic objects elicits retrieval of associated color knowledge. *Journal of Cognitive Neuroscience*, *36*, 1-22. doi:10.1162/jocn\_a\_02068
- Chetverikov, A. & **Jehee**, J.F.M. (2023). Motion direction is represented as a bimodal probability distribution in the human visual cortex. *Nature Communications*, *14*, 7634. doi:10.1038/s41467-023-43251-w
- van Mourik, T., Koopmans, P.J., Bains, L.J., Norris, D.G., & **Jehee**, J.F.M. (2023). Investigation of layer specific BOLD in the human visual cortex during visual attention. *Aperture Neuro*, Aug. 2023, 1-18. doi:10.52294/001c.87638
- Geurts, L.S., Cooke, J.R.H., van Bergen, R.S., & **Jehee**, J.F.M. (2022). Subjective confidence reflects representation of Bayesian probability in cortex. *Nature Human Behaviour*, *6*, 294-305. doi:10.1038/s41562-021-01247-w
- See for an independent commentary on this work:  
Mamassian, P. (2022). *Nature Human Behaviour*. doi:10.1038/s41562-021-01248-9
- Rahnev, D., et al. (2022). Consensus goals for the field of visual metacognition. *Perspectives on Psychological Science*, *17*, 1746–1765. doi:10.1177/17456916221075615
- Bertana, A., Chetverikov, A., van Bergen, R.S., Ling, S., & **Jehee**, J.F.M. (2021). Dual strategies in human confidence judgments. *Journal of Vision*, *21*, 21. doi:10.1167/jov.21.5.21
- van Bergen, R.S., & **Jehee**, J.F.M. (2019). Probabilistic representation in human visual cortex reflects uncertainty in serial decisions. *Journal of Neuroscience*, *39*, 8164-8176. doi:10.1523/jneurosci.3212-18.2019
- See for an independent commentary on this work:  
de Azevedo Neto, RM. (2020). doi:10.3389/fnhum.2020.580581
- Geurts, L.S., Chetverikov, A., Van Bergen, R.S., Zhou, Y.J., Bertana, A., & **Jehee**, J.F.M. (2018). Optimality is critical when it comes to testing computation-level hypotheses. *Behavioral and Brain Sciences*, *41*, e231. doi:10.1017/S0140525X18001450
- van Bergen, R.S., & **Jehee**, J.F.M. (2018). Modeling correlated noise is necessary to decode uncertainty. *NeuroImage*, *180*, 78-87. doi:10.1016/j.neuroimage.2017.08.015
- Moerel, D., Ling, S., & **Jehee**, J.F.M. (2016). Perceptual learning increases orientation sampling efficiency. *Journal of Vision*, *16:36*, 1-9. doi:10.1167/16.3.36
- van Bergen, R.S., Ma, W.J., Pratte, M.S., & **Jehee**, J.F.M. (2015). Sensory uncertainty decoded from visual cortex predicts behavior. *Nature Neuroscience*, *18*, 1728-30. doi:10.1038/nn.4150
- Ling\*, S., **Jehee\***, J.F.M., & Pestilli\*, F. (2015). A review of the mechanisms by which attentional feedback shapes selectivity. *Brain Structure and Function*, *220*, 1237-50. doi:10.1007/s00429-014-0818-5
- \* These authors contributed equally to this work.
- Bosch, S, **Jehee**, J.F.M., Fernández, G., & Doeller, C.F. (2014). Reinstatement of associate memories in early visual cortex is signaled by the hippocampus. *Journal of Neuroscience*, *34*, 7493-7500. doi:10.1523/JNEUROSCI.0805-14.2014

- Jehee**, J.F.M., Ling, S., Swisher, J.D., van Bergen, R.S., & Tong, F. (2012). Perceptual learning selectively refines orientation representations in early visual cortex. *Journal of Neuroscience*, *32*, 16747-16753. doi:10.1523/JNEUROSCI.6112-11.2012
- Kok, P., **Jehee**, J.F.M., & de Lange, F.P. (2012). Less is more: Expectation sharpens representations in the primary visual cortex. *Neuron*, *75*, 265-270. doi:10.1016/j.neuron.2012.04.034
- Ballard, D.H., & **Jehee**, J.F.M. (2012). Dynamic coding of signed quantities in cortical feedback circuits. *Frontiers in Psychology*, *3*. doi:10.3389/fpsyg.2012.00254
- Jehee**, J.F.M., Brady, D.K., & Tong, F. (2011). Attention improves encoding of task-relevant features in the human visual cortex. *Journal of Neuroscience*, *31*, 8210-8219. doi:10.1523/JNEUROSCI.6153-09.2011
- Kok, P., Rahnev, D., **Jehee**, J.F.M., Lau, H.C., & de Lange, F.P. (2011). Attention reverses the effect of prediction in silencing sensory signals, *Cerebral Cortex*, *9*, 2197-206. doi:10.1093/cercor/bhr310
- Ballard, D.H., & **Jehee**, J.F.M. (2011). Dual roles for spike signaling in cortical neural populations. *Frontiers in Computational Neuroscience*, *5*. doi:10.3389/fncom.2011.00022
- Jehee**, J.F.M., & Ballard, D.H. (2009). Predictive feedback can account for biphasic responses in the lateral geniculate nucleus. *PLoS: Computational Biology*, *5*. doi:10.1371/journal.pcbi.1000373
- Jehee**, J.F.M., & Murre, J.M.J. (2008). The scalable mammalian brain: Emergent distributions of glia and neurons. *Biological Cybernetics*, *98*, 439-445. doi:10.1007/s00422-008-0228-y
- Jehee**, J.F.M., Lamme, V.A.F., & Roelfsema, P.R. (2007). Boundary assignment in a recurrent network architecture. *Vision Research*, *47*, 1153-1165. doi:10.1016/j.visres.2006.12.018
- Jehee**, J.F.M., Roelfsema, P.R., Deco, G, Murre, J.M.J., & Lamme, V.A.F. (2007). Interactions between higher and lower visual areas improve shape selectivity of higher level neurons – explaining crowding phenomena. *Brain Research*, *1157*, 167-176. doi:10.1016/j.brainres.2007.03.090
- Meeter, M., **Jehee**, J.F.M., & Murre, J.M.J. (2007). Neural models that convince: Model hierarchies and other strategies to bridge the gap between behavior and the brain. *Philosophical Psychology*, *20*, 749-772. doi:10.1080/09515080701694128
- Jehee**, J.F.M., Rothkopf, C., Beck, J.M., & Ballard, D.H. (2006). Learning receptive fields using predictive feedback. *Journal of Physiology – Paris*, *100*, 125-132. doi:j.jphysparis.2006.09.011

## **Invited Talks and Colloquia**

### *Invited Seminars*

- 6/2023 Institut de Neurosciences de la Timone, Marseille, France (virtual)
- 5/2023 Stanford University, Stanford, CA
- 4/2023 University Medical Center Hamburg-Eppendorf, Hamburg, Germany (virtual)
- 9/2022 Netherlands Institute for Neuroscience & Spinoza Centre for Neuroimaging, Amsterdam, NL
- 9/2022 International Interdisciplinary Computational Cognitive Science Summer School, Tübingen, Germany (virtual)
- 7/2022 Max Planck School of Cognition, Dresden, Germany (virtual)
- 6/2022 International Max Planck Research School on Neuroscience of Communication, Leipzig, Germany (virtual)
- 4/2022 University College London, London, UK (virtual)
- 1/2021 Bernstein Center for Computational Neuroscience, Berlin, Germany (virtual)
- 11/2020 Zurich Center for Neuroeconomics, Zurich, Switzerland (virtual)
- 04/2020 University of Cambridge, Cambridge, UK (canceled due to the Covid-19 pandemic)
- 5/2019 Boynton Colloquium, University of Rochester, Rochester, NY
- 5/2019 Early Career Award winner talk, Vanderbilt University, Nashville, TN
- 9/2018 Helmholtz lecture, Utrecht University, Utrecht, Netherlands

6/2018	NeuroSpin, CEA-Saclay, France
8/2017	Free University, Amsterdam, Netherlands
10/2016	Central European University, Budapest, Hungary
9/2016	University of Oxford, Oxford, UK
9/2014	University of Amsterdam, Amsterdam, Netherlands
9/2013	University of Leuven, Leuven, Belgium
3/2013	University of Barcelona, Barcelona, Spain
1/2013	University of Amsterdam, Amsterdam, Netherlands
3/2012	Radboud University, Nijmegen, Netherlands
2/2012	Utrecht University, Utrecht, Netherlands
6/2009	Donders Center for Cognitive Neuroimaging, Nijmegen, Netherlands
5/2007	University of Leuven, Leuven, Belgium
4/2007	Vanderbilt University, Nashville, TN
2/2005	University of Rochester, Rochester, NY

### *Invited Conference Presentations*

9/2023	Keynote lecture, International Symposium on the Mathematics of Neuroscience, Rhodes, Greece
3/2023	Workshop on decision uncertainty and confidence, Cosyne, Montréal, Canada
7/2022	Keynote lecture, Perceptual Metacognition Meeting (satellite event of the Annual Meeting of the Association for the Scientific Study of Consciousness), Amsterdam, Netherlands
7/2021	Elman symposium, Annual Meeting of the Cognitive Science Society (virtual)
7/2021	Salzburg Mind-Brain Annual Meeting, Salzburg, Austria (virtual)
6/2021	Workshop Perceptual Confidence and Uncertainty, Paris, France (virtual)
11/2019	Workshop Generative Perception, Matera, Italy
3/2018	Workshop Probabilistic Brain, Durham, UK
2/2018	Workshop Computational Modeling of Decision Making, Paris, France
12/2017	Symposium on perceptual decision-making, biannual NVP Conference on Brain and Cognition, Egmond aan Zee, Netherlands
5/2017	Young Investigator Award winner talk, Annual Meeting of the Vision Sciences Society, FL
8/2016	Symposium Inversion Problems in Vision Science, European Conference on Visual Perception, Barcelona, Spain
6/2015	Workshop on predictive coding, University of Amsterdam, Amsterdam, Netherlands
12/2011	Symposium Perception & Decision Making, biannual NVP Conference on Brain and Cognition, Egmond aan Zee, Netherlands

### **Workshops and Meetings Organized**

2022	European Conference on Visual Perception (main meeting), Nijmegen, Netherlands (with 14 others)
2022	Workshop Encoding and Decoding Models in Neuroimaging, European Conference on Visual Perception, Nijmegen, Netherlands
2022	Symposium Computational Perspectives on Perceptual Confidence, European Conference on Visual Perception, Nijmegen, Netherlands (with Laura Geurts)
2020	Workshop Probabilistic Perception (virtual), Generative Adversarial Collaborations, Cognitive Computational Neuroscience Conference (with Doby Rahnev, Ned Block & Rachel Denison)
2013	Symposium Malleability of Visual Processing, biannual NVP Conference on Brain and Cognition, Egmond aan Zee, Netherlands (with Jan Brascamp)

### **Ad-Hoc Reviewer**

<i>Journals</i>	Biological Cybernetics, Brain and Cognition, Cerebral Cortex, Cognition, Cortex, Current Biology, eLife, Frontiers in Computational Neuroscience, Journal of Cognitive Neuroscience,
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Journal of Neurophysiology, Journal of Neuroscience, Journal of Vision, Nature Communications, Nature Human Behaviour, Nature Neuroscience, Neural Computation, Neural Networks, NeuroImage, Neurons Behavior Data analysis and Theory, PLoS Computational Biology, PLoS ONE, Psychological Science, Psychonomic Bulletin & Review

*Granting agencies* German Research Foundation (Germany), French National Research Agency (France), Medical Research Council (UK), National Science Foundation (USA), Research Foundation Flanders (Belgium), Wellcome Trust (UK)

## **Teaching and Advising**

### *Courses Taught*

2010-present Communication in cognitive neuroscience (SOW-DGCN28), graduate-level, course coordinator and main lecturer, School of Psychology & Donders Institute  
 2010, 2021 fMRI toolkit, graduate-level, guest lecture, Donders Institute  
 2021 Perception (SOW-DGCN44), graduate-level, guest lecture, School of Psychology & Donders Institute  
 2011-2015 Perception (SOW-DGCN44), graduate-level, guest lecture, School of Psychology & Donders Institute  
 2015 HealthPAC winter school, graduate-level, guest lecture, Donders Institute  
 2013 Bayesian neurocognitive modeling (SOW-MKI49), graduate-level, guest lecture, School of Psychology & Donders Institute  
 2012 Artificial intelligence colloquium, (under)graduate-level, guest lecture, School of Psychology & Donders Institute

### *Postdoctoral Trainees*

Ilona Bloem (2023-present)

Awarded a FoVea travel award (2023)

James Cooke (2019-present)

Laura Geurts (2021-2022; next position: researcher at Central Bureau for Statistics Netherlands)

Andrey Chetverikov (2017-2021/2022, next position: staff scientist at Donders Institute/ Assistant Professor at Bergen University, Norway)

Awarded a Vision Sciences Society Student Travel Fellowship (2020)

Awarded a Radboud Excellence postdoctoral fellowship (2017-2019)

Rosanne Rademaker (2020, next position: Max Planck group leader at ESI Frankfurt, Germany)

Awarded a Marie Skłodowska-Curie postdoctoral fellowship (2018-2020)

Ruben van Bergen (2016-2018, next position: postdoc at Columbia University, NY)

Awarded a Vision Sciences Society Student Travel Fellowship (2017)

Awarded prize for best poster at NVP Conference on Brain and Cognition (2017)

### *PhD Students*

Yuxuan Dai (2023-present)

Awarded graduate research scholarship from the China Scholarship Council (2023-2027)

Yin Joey Zhou (co-advised with Saskia Haegens and Floris de Lange; 2017-2021, next position: postdoc at Oxford University, UK)

Awarded travel fellowship for visiting the European Summer School of Vision, Rauschholzhausen, Germany (2021)

Laura Geurts (2016-2021, next position: postdoc at Donders Institute)

Awarded a Vision Sciences Society Student Travel Fellowship (2021)

Awarded travel fellowship for visiting the European Summer School of Vision, Rauschholzhausen, Germany (2021)

Awarded prize for best poster at NVP Conference on Brain and Cognition (2019)

Andrea Bertana (2014-2021; next position: data scientist)

Tim van Mourik (co-advised with David Norris, 2014-2018; next position: postdoc at Donders Institute)

Ruben van Bergen (2012-2016, next position: postdoc at Donders Institute)

Awarded the Radboud UMC Sensory Disorders Talent Award (2016)

Awarded prize for best poster at Donders Institute end-of-year poster session (2014)

Awarded prize for best abstract at Donders Discussions conference (2014)

Awarded travel fellowship for visiting the European Summer School of Vision, Rauschholzhausen, Germany (2014)

Juraj Mesik (visiting graduate student from University of Minnesota, 2015-2016, next position: postdoc at University of Minnesota, MN)

Rosanne Rademaker (visiting PhD student from Maastricht University, 2013-2015, next position: postdoc at University of California, San Diego, CA)

Awarded travel fellowship for visiting the European Summer School of Vision, Rauschholzhausen, Germany (2014)

Sander Bosch (co-advised with Christian Doeller, 2011-2015, next position: postdoc at Donders Institute)

### *MSc Students*

Leni Wei (2023-present)

Marc Pabst (2022-2023, next position: research assistant at University College London, UK)

Gwennyth Spruijtenburg (2017-2018, next position: trainee at Nijmegen city government)

Laura Geurts (2016, next position: PhD student at Donders Institute)

Joachim de Ronde (2014-2015, next position: graduate student at Concordia University, Canada)

Denise Moerel (2013-2014, next position: research assistant at Macquarie University, Australia)

Ilona Bloem (co-advised with Sam Ling, 2013-2014, next position: graduate student at Boston University, MA)

Awarded a travel fellowship from the Hendrik Muller Foundation for visiting the co-advisor's lab

Sridhar Jagannathan (2012-2013, next position: graduate student at Oxford University, UK)

Jasper Fabius (2012, next position: PhD student at Utrecht University, Netherlands)

### *Research Assistants*

Klaudia Ambroziak (2013-2015, next position: graduate student at University of London, UK)

Ruben van Bergen (2011-2012, next position: PhD student at Donders Institute)

### **University Service**

2012-present Member of examination board of the cognitive neuroscience master's program, School of Psychology and Donders Institute

2010-present Departmental PI meetings, Center for Cognitive Neuroimaging, Donders Institute

2014-2018 Work package leader of FP7-PEOPLE-2013-ITN project

2017 Member of search committee for principal investigator position in cognitive neuroscience, Donders Institute

2013-2015 Deputy chair and member of research infrastructure committee (RIC), Center for Cognitive Neuroimaging, Donders Institute

2014 Member of search committee for senior researcher position in MR Physics, Donders Institute

2013 Member of search committee for ICT system manager position, Donders Institute

2010 Member of search committee for principal investigator position in cognitive neuroscience, Donders Institute

### *PhD Thesis Committees*

Matthias Fritsche (Donders Institute, 2020), Pim Mostert (Donders Institute, 2019), Morgan Spence (University of Queensland Australia, 2018), Barrie Klein (University Utrecht, 2018), Katharine Shapcott (Donders Institute, 2017), Jim Herring (Donders Institute, 2017), Jeroen Atsma (Donders Institute, 2017), Eelke Spaak (Donders Institute, 2015), Frank Leoné (Donders Institute, 2014), Iris Groen (University of Amsterdam, 2014), Joke

Kalisvaart (Donders Institute, 2013), Marijke Brants (University of Leuven, 2013), Tessa van Leeuwen (Donders Institute, 2011), Ingrid Nieuwenhuis (Donders Institute, 2010)

### **Public Outreach**

2010-present Interviews about my lab's work for both local and national (web) magazines and newspapers. For recent examples, see:

<https://scientias.nl/we-hebben-allemaal-een-mini-rivm-in-onze-hersenpan-zitten/>

<https://www.radboudrecharge.nl/nl/artikel/onze-hersenen-zijn-een-rivm-in-het-klein>

2010-present Many lectures and demos by both me and members of my lab at local high schools, science fairs, science museums, etc.

2012 Keynote presentation for Brain Awareness Week event, Donders Institute

2008-2009 Several presentations at the Adventure Science Center, Nashville TN