

# Olivia Guest

October 2020

## BIO

I am a theoretical psychologist with expertise in computational modelling, and six years postdoctoral experience as a researcher. I work on a range of pure and applied issues in the field including: neuropsychology, model-based fMRI, decision-making, artificial intelligence, political psychology, and the methods and practice of computational research.

## CONTACT

**Email:** [o.guest@ucl.ac.uk](mailto:o.guest@ucl.ac.uk)

**GitHub:** [oliviaguest](https://github.com/oliviaguest)

**Website:** [oliviaguest.com](http://oliviaguest.com)

**Twitter:** [@o\\_guest](https://twitter.com/o_guest)

**Blog:** [neuropsychable.com](http://neuropsychable.com)

**ORCID:** [0000-0002-1891-0972](https://orcid.org/0000-0002-1891-0972)

## QUALIFICATIONS

**Ph.D.** *Towards a Unified Computational Account of Semantic Impairments* **2014**

[Birkbeck](#), UK. Supervisors: *Richard P. Cooper, Eddy J. Davelaar*

**M.Sc.** Cognitive and Decision Sciences (Distinction) **2010**

[University College London](#), UK.

**B.Sc.** Computer Science **2009**

[The University of York](#), UK.

## EMPLOYMENT HISTORY

**Donders Centre for Cognitive Neuroimaging**, Netherlands

*Postdoctoral Researcher* **2020–**

**RISE**, Cyprus

*Independent Researcher* **2019–2020**

**Department of Experimental Psychology**, [University College London](#), UK

*Postdoctoral Researcher* **2016–2019**

**Department of Experimental Psychology**, [University of Oxford](#), UK

*Postdoctoral Researcher* **2014–2016**

**Department of Psychological Sciences**, [Birkbeck](#), UK

*Graduate Teaching Assistant / Ph.D. student* **2010–2014**

## SERVICE

**ReScience C Journal** — Editor-in-Chief 2020–  
**The Journal of Open Source Software** — Topic Editor 2019–  
**ReScience C Journal** — Associate Editor 2015–2020

### Conferences (ad hoc reviewing)

International Conference on Cognitive Modelling (ICCM), International Conference on Machine Learning (ICML), Scientific Computing with Python Conference (SciPy), EnviroInfo.

### Journals (ad hoc reviewing)

Cognitive Science Journal, Cognitive Psychology, Memory & Cognition, PLoS Computational Biology, Journal of Cognitive Neuroscience, PeerJ.

### Special issue on **NeurIPS 2019 Reproducibility Challenge**

Co-editing special issue of Rescience C.

## MAIN PUBLICATIONS

**Guest, O.** & Birhane, A. (invited). Towards decolonising computational sciences. *Women, Gender & Research*

**Guest, O.** & Martin, A. E. (2020). **How computational modeling can force theory building in psychological science.** *Perspectives on Psychological Science.* [doi.org/10.31234/osf.io/rybh9](https://doi.org/10.31234/osf.io/rybh9)

*Contribution:* We argue for the wide adoption of computational modelling in psychology, and provide a practical framework (with examples) to support this goal.

Bobadilla Suárez, S., **Guest, O.**, & Love, B. C. (revise and resubmit). The neural link between subjective value and decision entropy. *Communications Biology.* [doi.org/10.1101/2020.02.18.954362](https://doi.org/10.1101/2020.02.18.954362)

*Contribution:* Using model-based fMRI, we demonstrated that areas of the brain, previously thought to be responsive to subjective outcome value in a gambling task, are actually more responsive to decision confidence than subjective value.

Barlas, P., Kyriakou, K., **Guest, O.**, Kleanthous, S., & Otterbacher, J. (accepted). To “See” is to Stereotype: Image Tagging Algorithms, Gender Recognition, and the Accuracy-Fairness Trade-off. *The 23rd ACM Conference on Computer-Supported Cooperative Work and Social Computing (CSCW 2020).*

*Contribution:* Several automatic gender detection systems are fooled by gender-stereotyped backgrounds. The system that is most human-like in its operation is also the one that is best at recognizing gender. *(Peer reviewed conferencing proceedings are typical in Computer Science).*

**Guest, O.**, Caso A. & Cooper, R. P. (2020). On Simulating Neural Damage in Connectionist Networks. *Computational Brain & Behavior* [doi.org/10.1007/s42113-020-00081-z](https://doi.org/10.1007/s42113-020-00081-z)

*Contribution:* We re-evaluate two classic connectionist models of neuropsychological deficits. In the case of the ‘hub and spoke’ model of semantic dementia, the original results are not robust.

**Guest, O.**, Kanayet, F. J., & Love, B. C. (2019). **Gerrymandering and Computational Redistricting.** *Journal of Computational Social Science.* [doi.org/10.1007/s42001-019-00053-9](https://doi.org/10.1007/s42001-019-00053-9)

*Contribution:* Partisan gerrymandering is a threat to democracy, and at the same time the drawing of optimal boundaries is beyond human capabilities. We created a computational model that draws boundaries based on a set of open principles, and does so more optimally than humans

**Guest, O.** & Love, B. C. (2017). *What the Success of Brain Imaging Implies about the Neural Code*. *eLife*, 6:e21397. doi.org/10.7554/eLife.21397

*Contribution:* Through proof and simulation, we determine which neural coding schemes are plausible given fMRI's successes and its limitations. Our results have implications for the nature of the neural code and ventral stream, as well as what can be successfully investigated with fMRI.

Love, B. C., Kopeć, Ł. & **Guest, O.** (2015). *Optimism Bias in Fans and Sports Reporters*. *PLoS ONE*, 10 (9). doi.org/10.1371/journal.pone.0137685

*Contribution:* We asked NFL fans to predict how many games teams they like and dislike would win in the 2015 season. Fans, like ESPN reporters assigned to cover a team, are overly optimistic about their team's prospects while the opposite pattern holds for teams that fans disliked.

Cooper, R. P. & **Guest, O.** (2014). *Implementations are not specifications: specification, replication and experimentation in computational cognitive modeling*. *Cognitive Systems Research*, 27, 42–49. doi.org/10.1016/j.cogsys.2013.05.001

*Contribution:* The specification of a computational theory, and the details of the way one implements that specification in a simulation, are importantly different. Failure to fully appreciate this difference can lead to undetected poor reproducibility. Replication of a model's predictions through independent implementation of a set of clear specifications is one answer.

#### OTHER PUBLICATIONS

Whitaker, K. J. & **Guest, O.** (in press). #bropenscience is broken science *The Psychologist*.

Botvinik-Nezer, R. et al. (2020). *Variability in the analysis of a single neuroimaging dataset by many teams*. *Nature*. doi.org/10.1038/s41586-020-2314-9

*Contribution:* I ran the model-based fMRI analysis for one of the 70 teams on this project.

Rougier, N. P. et al. (2017). *Sustainable computational science: the ReScience initiative*. *PeerJ Computer Science*. doi.org/10.7717/peerj-cs.142

Love, B. C., **Guest, O.**, Slomka, P., Navarro, V., Wasserman, E. (2017). *Deep Networks as Models of Human and Animal Categorization*. In *Proceedings of the 39th Annual Meeting of the Cognitive Science Society*. (pp. 1457–1458).

**Guest, O.** & Rougier, N. P. (2016). *What is computational reproducibility?* *IEEE CIS Newsletter on Cognitive and Developmental Systems*, 13 (1).

**Guest, O.** (2016). *Crisis in What Exactly?*. *The Winnower*. doi.org/10.15200/winn.146590.01538

**Guest, O.**, Cooper, R. P. & Davelaar, E. J. (2014). *The Influence of Implementation on "Hub" Models of Semantic Cognition*. In J. Mayor, P. Gomez (Eds.), *Computational Models of Cognitive Processes* (pp. 155–169). World Scientific.

**Guest, O.**, Cooper, R. P. & Davelaar, E. J. (2012). *Semantic Cognition: A Re-examination of the Recurrent Network "Hub" Model*. In *Proceedings of the Ninth International Conference on Cognitive Modelling*. Berlin, Germany. April. (pp. 259–264). Berlin, Germany. April. Universitätsverlag der TU Berlin.

SELECTED  
INVITED  
TALKS

**ReproducibiliTea UCL**

UCL, UK

14 Sep 2020

- Talk: *How computational modeling can force theory building in psychological science*
- Organisers: Emma Norris, Tabea Schoeler, & Jessie Baldwin

**MathPsych/ICCM 2020**

Toronto, Canada

25–28 Jul 2020

- Symposium: *Perspectives on “What makes a good theory?”*
- Organisers: Iris van Rooij & Chris Donkin
- Talk: *How computational modelling can force theory building in psychological science.*
- [Link to video.](#)

**RIOT Science Club**

King's College London, London, UK

2 Jul 2020

- Talk: *How computational modeling can force theory building in psychological science*
- Organiser: Miguel Xochicale
- [Link to video.](#)

**ReproducibiliTea Glasgow**

Univeristy of Glasgow, UK

20 Apr 2020

- Talk: *How computational modeling can force theory building in psychological science*
- Organisers: Anna Henschel & Stephanie Allan
- Speakers: Olivia Guest & Andrea E. Martin

**Research Centre on Interactive Media, Smart Systems and Emerging Technologies**

Nicosia, Cyprus

16 Jul 2019

- Talk: *What do deep neural networks know?*

**Thirty-fifth International Conference on Machine Learning (ICML 2018)**

Workshop: *Enabling Reproducibility in Machine Learning MLTrain@RML*

Stockholm, Sweden

14 Jul 2018

- Talk: *Varieties of Reproducibility in Empirical and Computational Domains.*

**Open Data Day 2018**

Goldsmiths, University of London, UK

3 Mar 2018

- Talk: *Gerrymandering and Computational Redistricting.*

**Cognitive Neuroscience Friday Seminar (FriSem)**

Stanford University, California, USA

16 Feb 2018

- Talk: *How deep networks contribute to our understanding of human and animal representation in categorization.*

**Research Programming Technical Social**

University College London, UK

15 Nov 2017

- Talk: *Gerrymandering and Computational Redistricting.*

### Centre for Language Studies

Radboud University, The Netherlands

8 Mar 2017

- Talk: *What the Success of Brain Imaging Implies about the Neural Code.*

### London Judgement and Decision Making Seminars

University College London, UK

8 Feb 2017

- Talk: *What the Success of Brain Imaging Implies about the Neural Code.*

### Summerfield Lab

University of Oxford, UK

23 Nov 2016

- Talk: *What the Success of Brain Imaging Implies about the Neural Code.*

### CONFERENCE PRESENTATIONS

#### MathPsych/ICCM 2020

Virtual

20 Jul 2020

- Talk (invited): *How computational modelling can force theory building in psychological science.*
- [Link to video.](#)

#### Open Science Room at Organisation for Human Brain Mapping (OHBM)

Virtual

30 Jun 2020

- Panel discussion (invited): *Past, Present and Future of Open Science (Emergent session): Pre-registration, Registered reports.*
- [Link to video.](#)

#### Society for Neuroscience (SfN 2019)

Chicago, USA

19–23 Oct 2019

- Poster: *The neural link between subjective value and decision entropy.*
- Presented by: S. Bobadilla Suarez

#### 9th Annual Scientific Conference of Center for Applied Neuroscience

Nicosia, Cyprus

4 Oct 2019

- Talk (invited) and poster: *Levels of Representation in a Deep Learning Model of Categorization.*

#### 18th Annual Summer Interdisciplinary Conference (ASIC 2019)

Seefeld, Austria

17–22 Jun 2019

- Talk: *Levels of Representation in a Deep Learning Model of Categorization.*

#### 39th Annual Meeting of the Cognitive Science Society (CogSci 2017)

London, UK

26–29 Jul 2017

- Talk: *Deep Networks as Models of Human and Animal Categorization.*

#### 16th Annual Summer Interdisciplinary Conference (ASIC 2017)

Interlaken, Switzerland

15–20 Jul 2017

- Talk: *Deep Networks as Models of Human and Animal Categorization.*

#### 1st Lancaster Conference on Infant and Early Child Development (LCICD 2016)

Lancaster, UK

25–27 Aug 2016

- Talk: *Representational Re-description in hSOMs*.

#### 15th Annual Summer Interdisciplinary Conference (ASIC 2016)

Selva, Val Gardena, Italy

3–8 Jul 2016

- Talk: *What the Success of Brain Imaging Implies about the Neural Code*.

#### 14th Annual Summer Interdisciplinary Conference (ASIC 2015)

Mammoth Lakes, California, USA

10–15 Jul 2015

- Talk: *Optimism Bias in Novice and Expert Sport Forecasting*.

#### 13th Neural Computation and Psychology Workshop (NCPW 13)

BCBL, San Sebastian, Spain

12–14 Jul 2012

- Talk: *Exploring the influence of architecture and learning algorithm on the breakdown of the “hub” model of semantic cognition*.

#### 11th International Conference on Cognitive Modeling (ICCM 2012)

Technische Universität Berlin, Berlin, Germany

12–15 Apr 2012

- Poster: *Semantic Cognition: A Re-examination of the Recurrent Network “Hub” Model*.
- Won Best Student Poster Prize.

## ORGANISING

#### Queer in AI @ ICML 2020 Workshop

Virtual

14 Jul 2020

- Organised and ran *COVID-19 Issues and LGBTQ Folks in ML/AI* with Stephen Mouldrem, Mustafa I. Hussain, and Luke Stark.

#### 18th Scientific Computing with Python Conference (SciPy 2019)

Austin, Texas, USA

8–14 Jul 2019

- Chaired cognitive science and neuroscience mini-symposium with Nicolas P. Rougier.
- Reviewed conference submissions.

#### Women in Cognitive Science (WiCS) Panel at 40th Annual Meeting of the Cognitive Science Society (CogSci 2018)

Madison, Wisconsin, USA

25 Jul 2018

- Topic: *Women and Gender Minorities in Computational Cognitive Science: Sharing Experiences*.
- Co-organised with Nora S. Newcombe.

#### 16th Scientific Computing with Python Conference (SciPy 2017)

Austin, Texas, USA

10–16 Jul 2017

- Chaired neuroscience mini-symposium with Ariel Rokem.
- Reviewed conference submissions.

#### Research Data Visualisation Workshop (RDVW)

Software Sustainability Institute, University of Manchester

28 Jul 2016

- Organised 1-day workshop with Raniere Silva (main organiser) and Vince Knight.
- Member of steering committee.
- Obtained funding from RStudio.

#### Introduction to Computational Cognitive Modelling Workshop

	<p>CCCM, Birkbeck</p> <p>23–25 Apr 2014</p> <ul style="list-style-type: none"> <li>Organised 3-day workshop with <a href="#">Chris Brand</a> (co-organiser).</li> <li>Prepared slides, exercises, created website.</li> </ul>
TEACHING	<p><b>Department of Experimental Psychology, University of Oxford, UK</b></p> <p>Postdoctoral Research Assistant</p> <p>2014–2016</p> <p><i>Block Practical: Connectionist Models and Cognitive Processes</i></p> <ul style="list-style-type: none"> <li>Module: <i>Third Year, B.Sc.</i></li> <li>Designed course structure and materials (slides and exercises).</li> <li>Students replicated from scratch Tyler et al. (2000) in Python.</li> <li>Created course website: <a href="http://oliviaguest.com/connectionism">oliviaguest.com/connectionism</a>.</li> </ul> <p><i>Tutorial: Language and Cognition</i></p> <ul style="list-style-type: none"> <li>Module: <i>Second Year, B.Sc.</i></li> <li>Set essays and marked exams.</li> </ul> <p><b>Department of Psychological Sciences, Birkbeck, University of London, UK</b></p> <p>Graduate Teaching Assistant</p> <p>2010–2014</p> <ul style="list-style-type: none"> <li>Modules Taught: <i>General Foundations of Psychology, Psychobiology, Advanced Research Methods, Advanced Quantitative Methods, Memory and Cognition, Matlab Programming for Psychological Science,</i></li> </ul>
MAINSTREAM MEDIA	<p><b>Gerrymandering and computational redistricting</b></p> <p>2017</p> <ul style="list-style-type: none"> <li>Media Coverage: <i>An Unbiased Algorithm Could Help Put an End to Partisan Gerrymandering</i>, Seeker</li> </ul> <p><b>BBC Radio 4: Today Show</b></p> <p>2016</p> <ul style="list-style-type: none"> <li>Interview: <i>What can we learn in 4 months?</i></li> </ul> <p><b>Optimism bias in fans and sports reporters</b></p> <p>2015</p> <ul style="list-style-type: none"> <li>Press Releases: <a href="#">University of Oxford</a>, <a href="#">UCL</a></li> <li>Media Coverage: <a href="#">CS Monitor</a>, <a href="#">Medical Daily</a>, <a href="#">MinnPost</a>, <a href="#">Newsweek</a>, <a href="#">Pacific Standard</a>, <a href="#">Phys.org</a>.</li> </ul>
TECHNICAL SKILLS	<p><b>General</b></p> <ul style="list-style-type: none"> <li>Web design (e.g., <a href="http://bradlove.org">bradlove.org</a>, <a href="http://neuroplausible.com">neuroplausible.com</a>, <a href="http://oliviaguest.com">oliviaguest.com</a>, <a href="http://redistrict.science">redistrict.science</a>, <a href="http://compcog.science">compcog.science</a>).</li> <li>Graphic design and image editing (i.e., Adobe Suite, GIMP, Inkscape).</li> <li>GUI design (i.e., PyGTK, GTK+).</li> <li>Artificial neural networks (e.g., TensorFlow).</li> <li>Unix (e.g., CLI, server administration).</li> </ul> <p><b>Programming</b></p> <p>Ada, C, C++, C#, Java, JavaScript, <math>\text{\LaTeX}</math>, MATLAB, OpenGL, Pascal, PHP, Prolog, Python, R, Scheme, SQL, Visual Basic.</p>
THINGS I HAVE NAMED	<p><b>Labs:</b> CitAI, Psicofisika</p> <p><b>Organisations:</b> AntiRa</p> <p><b>Software:</b> Caladown</p>