last updated: March 24, 2021

Zoey J. Isherwood

Department of Psychology, University of Nevada, Reno, 89557 USA
E-mail: zisherwood@unr.edu

research interests: visual perception, natural scene statistics, colour vision

skills at a glance: fMRI and psychophysics

EDUCATIONAL QUALIFICATIONS

UNSW Sydney (Sydney, Australia) **2014 to 2018**

PhD (Conferral date: February 27, 2019)

Thesis title: A BOLD approach to natural scene statistics

Supervisors: Prof. Branka Spehar and Dr. Mark Schira

UNSW Sydney (Sydney, Australia) **2010 to 2013**

Bachelor of Science (Honours Class I), Major: Neuroscience

Honours thesis title:

Modulation of natural image statistics and its effect on aesthetic perception and the BOLD response

Supervisors: Prof. Branka Spehar and Dr. Mark Schira

RESEARCH PAID EMPLOYMENT

University of Nevada, Reno (Reno NV, USA) **March 2020 to Present**

Postdoctoral Scholar (Supervisor: Prof. Michael Webster)

- Conducting fMRI and psychophysical experiments, processing and analysing data
- Programming visual stimuli for fMRI and psychophysical experiments
- Training and assisting other team members with fMRI scanning and psychophysical experimental protocols
- *Research focus*: the cortical and behavioural underpinnings of colour perception and adaptation

University of Wollongong (Wollongong, Australia) **May 2018 to February 2020**

Postdoctoral Research Associate (Supervisor: Dr. Mark Schira)

- Conducted fMRI and psychophysical experiments, processing and analysing data
- Programmed visual stimuli for fMRI and psychophysical experiments
- Training and assisting other team members with fMRI scanning and psychophysical experimental protocols
- *Research focus*: visual perception and the organisation of visual cortex

UNSW Sydney (Sydney, Australia) **January 2017 to May 2018**

Casual Research Assistant (Supervisor: Prof. Branka Spehar)

- Conducted fMRI and psychophysical experiments, processed and analysed data
- Programmed visual stimuli for fMRI and psychophysical experiments
- Trained and assisted other team members (honours students and research assistants)
- *Research focus*: aesthetics and natural scene perception

Neuroscience Research Australia (NeuRA) (Sydney, Australia) **May 2012 to May 2018**

Casual Research Assistant (Supervisor: Dr. Mark Schira)

- Conducted fMRI experiments, processed and analysed fMRI data
- Programmed visual stimuli for fMRI experiments
- Trained and assisted other team members with fMRI scanning and experimental protocols
- *Research focus*: the organisation and function of human visual cortex

---

Canon Information Systems Research Australia (CiSRA) (Sydney, Australia) **July 2017 to November 2017**

Part Time Research Associate (Supervisor: Dr. Juno Kim)

- Conducted and programmed psychophysical experiments
- Created code to generate stimuli using Python and Blender software
- Gained familiarity with research projects with outcomes involving intellectual property and patents
- *Research focus*: material perception in relation to gloss and colour

---

UNSW Sydney (Sydney, Australia) **December 2013 to June 2014**

Full Time Research Assistant (Supervisor: Prof. Branka Spehar)

- Conducted fMRI experiments, processed and analysed fMRI data
- Programmed visual stimuli for experiments
- *Research focus*: aesthetics and natural scene perception

RESEARCH WORK EXPERIENCE

RIKEN Brain Science Institute Summer Program (Wako, Japan) **June 2014 to August 2014**

Full Time Research Intern (Supervisor: Dr. Andrea Benucci)

- Gained experience handling and imaging transgenic mice in vivo using 2-photon microscopy
- *Research focus*: natural scene statistics and visual perception in mouse visual cortex

---

School of Psychology (University of Wollongong) Summer Scholarship Program (Wollongong, Australia) **December 2013 to February 2014**

Full Time Research Intern (Supervisor: Dr. Mark Schira)

- Furthered and improved my knowledge of fMRI analysis and processing techniques
- *Research focus*: higher order visual areas in human visual cortex (V3AB, LO, VO, and V4) in relation to the processing of natural scene statistics

TEACHING EXPERIENCE

University of Wollongong (Wollongong, Australia) **October 2018 to August 2019**

Lecturer

- Lectured a third-year psychology course (PSY349) on visual perception

UNSW Sydney (Sydney, Australia) **August 2015 to October 2017**

Casual Tutor

- Taught both the Perception and Cognition components of PSYC2071 (Perception and Cognition) for 3 semesters (Semester 2 2015, 2016, and 2017)

RESEARCH PUBLICATIONS

2021 10) Tregillus, K.E.M., **Isherwood, Z.J.**, Vanston, J.E., Engel, S.A., MacLeod, D.I.A., Kuriki, I., Webster, M.A. (2021). Color compensation in anomalous trichromats assessed with fMRI. *Current Biology*, 31, 1-7. doi: 10.1016/j.cub.2020.11.039.

9) **Isherwood, Z.J.**, Huynh-Thu, Q., Arnison, M., Monaghan, D., Toscani, M., Perry, S., Honson, V., Kim, J. (2021). Surface properties and the perception of color. *Journal of Vision*, *21*(2):7, 1–22. doi: 10.1167/jov.21.2.7.

8) **Isherwood, Z.J.**, Clifford, C.W.G., Schira, M.M, Roberts, M.M., Spehar, B. (2021). Nice and slow: Measuring sensitivity and visual preference toward naturalistic stimuli varying in their amplitude spectra in space and time. *Vision Research,* 181, 47-60. doi: 10.1016/j.visres.2021.01.001.

2020 7) **Isherwood, Z.J.,** Joyce, D.S., Kuppuswamy Parthasarathy, M., Webster, M.A. (2020). Plasticity in perception: insights from color vision deficiencies. *Faculty Reviews*, 9(8). doi: 10.12703/b/9-8.

6) Puckett, A.M., Schira, M.M., **Isherwood, Z.J.**, Victor, J.D., Roberts, J.A., Breakspear, M. (2020). Manipulating the structure of natural scenes using wavelets to study the functional architecture of perceptual hierarchies in the brain. *NeuroImage*, 221, 117173. doi: 10.1016/j.neuroimage.2020.117173.

5) Honson, V., Huyn-Thu, Q., Arnison, M.R., Monaghan, D., **Isherwood, Z.J.**, Kim, J. (2020). Effects of Shape, Roughness and Gloss on the Perceived Reflectance of Colored Surfaces. *Frontiers in Psychology*, 11, doi: 10.3389/fpsyg.2020.00485

2019 4) Mancini, F., Wang, A.P, Schira, M.M., **Isherwood, Z.J.**, McAuley, J.H., Iannetti, G.D., Sereno, M.I., Moseley, G.L., Rae, C.D. (2019). Fine-grained mapping of cortical somatotopies in chronic complex regional pain syndrome. *Journal of Neuroscience*, 39(46), 9185-9196, doi: 10.1523/JNEUROSCI.2005-18.2019.

3) Viengkham, C., **Isherwood, Z.J.**, Spehar, B. (2019). Fractal-Scaling Properties as Aesthetic Primitives in Vision and Touch*. Axiomathes,* 1-20. doi: 10.1007/s10516-019-09444-z.

2) Boyd Taylor, H.G., Puckett, A.M., **Isherwood, Z.J.**, Schira, M.M. (2019). Vascular effects on the BOLD response and the retinotopic mapping of hV4*. PLOS ONE, 14(6): e0204388*. doi: 10.1371/journal.pone.0204388

2017 1) **Isherwood, Z.J.**, Schira, M.M., Spehar, B. (2017). The tuning of human visual cortex to variations in the $1/f^{\alpha}$ amplitude spectra and fractal properties of synthetic noise images*. NeuroImage, 146,* 642-657. doi: 10.1016/j.neuroimage.2016.10.013.

CONFERENCE PRESENTATIONS

**first author is the presenting author, unless stated otherwise*

Oral Presentations

2019 7) **Isherwood, Z.J.**, Clifford, C.W.G., Schira, M.M., & Spehar, B. (2019, August). *The tuning of early visual cortex to the fractal structure of natural scenes.* Talk given at the Asia Pacific Conference on Vision, Osaka, Japan.

2018 6) **Isherwood, Z.J.**, Clifford, C.W.G., Schira, M.M., & Spehar, B. (2018, May). *BOLD tuning of human visual cortex to natural statistical properties in space and time.* Talk given at the Vision Sciences Society Conference, St. Pete Beach, FL, United States.

2017 5) **Isherwood, Z.J.**, Clifford, C.W.G., Schira, M.M., & Spehar, B. (2017, November). *The neural tuning of the human visual system to the statistical properties of dynamic natural scenes.* Talk given at the Sydney Psychology Postgraduate Conference, Sydney, Australia.

4) Spehar, B., Clifford, C.W.G., **Isherwood, Z.J.** (2017, August). *Sensitivity and aesthetic preference in dynamic naturalistic stimuli varying in their spatiotemporal amplitude spectra.* Talk given at the European Conference on Visual Perception, Berlin, Germany.

2016 3) **Isherwood, Z.J.**, Clifford, C.W.G., & Spehar, B. (2016, November). *Measuring the sensitivity and aesthetic preference of naturalistic stimuli varying in their amplitude spectra in space and time.* Talk given at the Sydney Psychology Postgraduate Conference, Sydney, Australia.

2014 2) **Isherwood, Z.J.,** Schira, M.M., & Spehar, B. (2014, November). *The BOLD and the Beautiful: Neural responses to natural scene statistics in early visual cortex*. Talk given at the Sydney Psychology Postgraduate Conference, Sydney, Australia.

1) Spehar, B., **Isherwood, Z.J.**, Schira, M.M. (2014, August). Aesthetic and neural responses to synthetic images varying in their amplitude spectrum. Talk given at the European Conference on Visual Perception, Belgrade, Serbia.

Poster Presentations

2020 26) Puckett, A.M., **Isherwood, Z.J.**, York, A., Viengkham, C., Spehar, B. (2020). *Probing human somatosensory cortex using ultra-high field (7T) fMRI and 3D-printed fractal textures.* Poster presented at the International Society for Magnetic Resonance in Medicine (*online*).

25) **Isherwood, Z.J.**, Roberts, M.M., & Schira, M.M. (2020, May). *Nature in motion—the psychophysical tuning of the visual system to the fractal properties of natural scenes in both space and time.* Presented at the Vision Sciences Society Conference (*online).*

2019 24) Roberts, M.M., Schira, M.M., Isherwood, Z.J. (2019, November). *Visual processing of the spatiotemporal fractal properties of natural scenes*. Poster presented at the Australasian Society for Psychophysiology Conference, Wollongong, Australia.

23) Roberts, M.M., Schira, M.M., Isherwood, Z.J. (2019, November). *Fractals in Motion: The visual system's reliance on the fractal structure of nature across spatial and temporal domains*. Poster presented at the 9th Australasian Cognitive Neuroscience Conference, Launceston, Australia.

22) Nguyen, L.Y.D., **Isherwood, Z.J.**, Spehar, B. (2019, August). *The geometric, not photometric structure of synthetic images determines discrimination sensitivity, perceived similarity and visual preferences.* Poster presented at the Asia Pacific Conference on Vision, Osaka, Japan.

21) **Isherwood, Z.J.**, Clifford, C.W.G., Schira, M.M., & Spehar, B. (2019, May). *The critical reliance of early visual cortex on the fractal structure of natural scenes.* Poster presented at the Vision Sciences Society Conference, St. Pete Beach, FL, United States.

20) Viengkham, C., **Isherwood, Z.J.**, & Spehar, B. (2019, May). *Fractal statistics in the aesthetic appreciation of images, textures and sound.* Poster presented at the Vision Sciences Society Conference, St. Pete Beach, FL, United States.

2018 19) **Isherwood, Z.J.**, Clifford, C.W.G., Schira, M.M., & Spehar, B. (2018, August). *The critical reliance of early visual cortex on the fractal structure of natural scenes.* Poster presented at the 8th Australasian Cognitive Neuroscience Conference, Melbourne, Australia.

18) Taylor, H., Puckett A.M., **Isherwood, Z.J.****, & Schira M.M. (2018, May). *Why are retinotopic maps of human V4 incomplete in the left hemisphere?* Poster presented at the Vision Sciences Society Conference, St. Pete Beach, FL, United States. ***presenting author*

2017 17) **Isherwood, Z.J.**, Clifford, C.W.G., Schira, M.M., & Spehar, B. (2017, November). *The tuning of human visual cortex to naturalistic stimuli varying in their 1/f*$^{\alpha}$ *amplitude spectra in both space and time.* Poster presented at the European Conference on Visual Perception, Berlin, Germany.

16) Viengkham, C.**, Isherwood, Z.J.**, & Spehar, B. (2017, August). *Equivalent preferences for fractal scaling characteristics in vision and touch.* Poster presented at the European Conference on Visual Perception, Berlin, Germany.

2016 15) **Isherwood, Z.J.**, Clifford, C.W.G., & Spehar, B. (2016, November). *Measuring the sensitivity and aesthetic preference of naturalistic stimuli varying in their amplitude spectra in space and time.* Poster presented at the 6th Australasian Cognitive Neuroscience Conference, Shoal Bay, Australia.

14) Viengkham, C.**, Isherwood, Z.J.**, & Spehar, B. (2016, November). *Universal preferences and individual differences in aesthetics: An exploratory comparison between vision and touch.* Poster presented at the 6th Australasian Cognitive Neuroscience Conference, Shoal Bay, Australia.

13) **Isherwood, Z.J.**, Schira, M.M., Spehar, B. (2016, June). *The tuning of human visual cortex to 1/f$^{\alpha}$ amplitude spectra*. Poster presented at the 22nd Annual Meeting of the Organization for Human Brain Mapping, Geneva, Switzerland.

12) Taylor, H., Puckett A.M., **Isherwood, Z.J.**, & Schira, M.M. (2016, June). *Venous artefact cannot explain why incomplete hV4 maps appear predominantly in the left hemisphere*. Poster presented at the 22nd Annual Meeting of the Organization for Human Brain Mapping, Geneva, Switzerland.

2015 11) **Isherwood, Z.J.,** Schira, M.M., & Spehar, B. (2015, October). *The tuning of human visual cortex to variations in the 1/f amplitude spectra of synthetic noise images*. Poster presented at the 45th Annual Meeting of the Society of Neuroscience, Chicago, IL, United States.

10) Puckett A.M., Aquino, K., **Isherwood, Z.J.**, & Schira, M.M. (2015, June). *Laminar Differences in Retinotopic Maps: Measured and Modeled*. Poster presented at the 21st Annual Meeting of the Organization for Human Brain Mapping, Honolulu, HI, United States.

9) Taylor, H., Puckett A.M., **Isherwood, Z.J.**, & Schira, M.M.**. (2015, June). *Mapping human V4: Correcting venous artefact reveals hemifield organisation*. Poster presented at the 21st Annual Meeting of the Organization for Human Brain Mapping, Honolulu, HI. ***presenting author*

8) **Isherwood, Z.J.,** Schira M., & Spehar, B. (2015, April). *What's more ecologically relevant? Spatial vs. intensity based image characteristics of natural scenes*. Poster presented at the 42nd Australasian Experimental Psychology Conference, Sydney, Australia.

7) Taylor, H., Puckett A.M., **Isherwood, Z.J.**, & Schira, M.M. (2015, April). *Mapping human V4: Correcting artefact reveals hemifield organisation*. Poster presented at the 42nd Australasian Experimental Psychology Conference, Sydney, Australia.

2014 6) Wang, A.P., Mancini, F., Schira, M.M., McAuley, J.H., **Isherwood, Z.J.**, Iannetti, G., Rae, C.D., & Moseley, G.L. (2014, December). *Developing a time efficient tactile paradigm for fingertip representation in the primary somatosensory cortex in pathological pain*. Poster presented at the 1st CiNet Conference: New Directions in Pain Neuroscience, Osaka, Japan.

5) Wang, A.P., Mancini, F., Schira, M.M., McAuley, J.H., **Isherwood, Z.J.**, Iannetti, G., Rae, C.D., & Moseley, G.L. (2014, October). *Developing a time efficient tactile paradigm for fingertip representation in the primary somatosensory cortex in pathological pain.* Poster presented at the IASP, 15th World Congress on Pain, Buenos Aires, Argentina.

4) **Isherwood, Z.J.,** Schira, M.M., & Spehar, B. (2014, July). *The BOLD and the Beautiful: Neural responses to natural scene statistics in early visual cortex*. Poster presented at the 10th Asia-Pacific Conference on Vision, Takamatsu, Japan.

3) Wang, A.P., Schira, M.M., McAuley, J.H., **Isherwood, Z.J.,** Rae, C.D., & Moseley, G.L. (2014, March). *Finger representation in the primary somatosensory cortex using visual field mapping techniques: a pilot study*. Poster presented at PainAdelaide, Adelaide, Australia.

2013 2) Wang, A.P., Schira, M.M., McAuley, J.H., **Isherwood, Z.J.**, Rae, C.D., & Moseley, G.L. (2013, October). *Finger representation in the primary somatosensory cortex using visual field mapping techniques: a pilot study*. Poster presented at the 8th European Federation of IASP Chapters Satellite Symposium — Neural Circuits Underlying Nociception and Pain and Their Plasticity, Heidelberg, Germany

1) Schira, M.M., Lei, J., Yakupov, R., Kaule, F., Speck, O., Aquino, K.M., **Isherwood, Z.J.**, Breakspear, M.J., & Hoffmann, M.B. (2013, June). *High resolution fMRI at 3T and 7T shows large BOLD signal modulation significantly confounding head motion estimates*. Poster presented at the 19th Annual Meeting of the Organization for Human Brain Mapping, Seattle, WA, United States.

AWARDS AND FUNDING

V-VSS Elsevier/Vision Research Travel Award, 2021. *Awarded funds to cover conference presenter fees.*

International Colour Vision Society (ICVS) Summer School Prize, 2020. *Awarded 2 years ICVS membership.*

UNSW Sydney Dean's Award for Outstanding PhD Theses, 2019.

> *To be eligible for this award, candidates must produce a thesis that requires only minimal corrections, received outstanding and/or excellent levels of achievement for all examination criteria, and in the opinion of both examiners is in the top 10% of PhD theses examined.*

Australian Postgraduate Award (APA), 2014 — 2018. *Awarded $24,392 AUD per annum*.

Sydney Postgraduate Psychology Conference (SPPC) Best Presentation Award, 2017. *Awarded $200 AUD.*

UNSW Sydney Postgraduate Research Support Scheme Travel Funds, 2015. *Awarded $2,820 AUD.*

Asia-Pacific Conference on Vision (APCV) Student Travel Award, 2014. *Awarded ¥100,000 JPY*.

School of Psychology (University of Wollongong) Summer Scholarship, 2013 — 2014. *Awarded $4,000 AUD*.

OUTREACH & ORGANISATION

2021 Executive board member of the University of Nevada, Reno Postdoctoral Association (UNRPA)

> *Currently serving a 1-year term (2021-2022) as the Communications & Technology Director of the UNRPA. My role involves developing and maintaining the UNRPA communication channels, including its online presence and online outreach activities. Other duties include managing initiatives that enhance the recognition and reputation of the UNRPA.*

Cognitive and Brain Sciences Brown Bag Postdoc Panel (2021, February) (Reno NV, USA) (*online*)

> *Participated as a panellist in a session targeted toward graduate students who wanted to learn more about how to find a postdoc, when to look, what postdoctoral options exist, and how to find funding.*

2020 Organisation of seminars at the University of Nevada, Reno (Reno NV, USA) (*online)*

> *Organised, managed, and advertised four online seminars with international speakers as part of the Department of Psychology's NeuroLecture Series and Early Career Seminar Series.*

2018 L'Oreal Girls in Science Day (2018, November) (Sydney, Australia)

> *Presented my research as part of a group of scientists representing the School of Psychology at UNSW Sydney. This was an event where high school students with a passion for science could hear about each scientist's research and experience as woman scientists, whilst also discuss the potential for future study or careers in science.*

School of Psychology Careers and Networking Event (2018, April) (Sydney, Australia)

> *Participated as a careers panellist with past experience in Industry. This panel was held for undergraduate psychology students at UNSW Sydney as part of a Careers and Networking event.*

2015 Sydney Science Festival —Speed Meet A Scientist (2015, August) (Sydney, Australia).

> *Participated as one of the scientists that festival attendees could meet and talk to. Attendees included both scientists and the general public.*

INVITED TALKS

2020 UNSW Sydney, School of Optometry, Vaegan Seminar (2020, June) (Sydney, Australia) (*online)*

2019 University of Reno, Nevada, Department of Psychology, NeuroLecture Seminar (2019, June) (Reno NV, USA)

2017 Canon Information Systems Research Australia (CiSRA) (2017, September) (Sydney, Australia)

2015 University of Sydney, School of Physics, Complex Systems Group (2015, May) (Sydney, Australia)

TECHNICAL SKILLS

- MATLAB and Python programming skills
- fMRI data processing and analysis using the mrVista toolbox, SPM, and Freesurfer
- fMRI and psychophysical experimental design and stimulus presentation coding in MATLAB using Psychtoolbox
- Brain segmentation using ITK-Snap/ITK-Gray and Freesurfer
- Stimulus generation using MATLAB, Python, and Blender

ACADEMIC REFEREES

Prof. Michael Webster

Relation: Current Postdoc Supervisor

Foundation Professor, Department of Psychology, University of Nevada, Reno
E-mail: mwebster@unr.edu Phone Number: +1 775 682 8691

Dr. Mark Schira

Relation: Previous Postdoc Supervisor / PhD Supervisor

Senior Lecturer, School of Psychology, University of Wollongong
Honorary Senior Research Officer, Neuroscience Research Australia
E-mail: mark.schira@gmail.com Phone Number: +61 (0) 2 4239 2501

Prof. Branka Spehar

Relation: PhD Supervisor

Professor, School of Psychology, UNSW Sydney
E-mail: b.spehar@unsw.edu.au Phone Number: +61 (0) 2 9385 1463

A/Prof. Juno Kim

Relation: Former supervisor

Senior Lecturer, School of Optometry, UNSW Sydney
E-mail: juno.kim@unsw.edu.au Phone Number: +61 (0) 2 9385 7474