

# Hao-Ting Wang, PhD

## Postdoctoral Researcher in neuroimaging and neuroinformatics

Centre de recherche de l'Institut universitaire de gériatrie de Montréal (CRIUGM)  
Montréal, Québec, Canada

### RESEARCH POSITIONS

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#### Postdoctoral Researcher

*Centre de recherche de l'Institut universitaire de gériatrie de Montréal (CRIUGM)*

Sept. 2021 – Present  
Montréal, QC, Canada

Principal Investigators: Prof Pierre Bellec, Prof Louis De Beaumont

Data infrastructure for neuroimaging research and Alzheimer's neural biomarker discovery.

#### Research Fellow

*Sackler Centre for Consciousness Science, University of Sussex*

Sept. 2019 – Aug. 2021  
Brighton, United Kingdom

Principal Investigators: Prof Hugo Critchley, Prof Sarah Garfinkle

Cognitive processes in psychiatric conditions with neuroimaging and physiology measures.

#### Postdoctoral Research Associate

*University of York*

Nov. 2018 – Aug. 2019  
York, United Kingdom

Principal Investigator: Prof Jonathan Smallwood

Working on the European Research Council funded project—Wandering Minds

#### Research Administrator

*University of York*

Oct. 2015 – Oct. 2018  
York, United Kingdom

Principal Investigators: Prof Jonathan Smallwood and Prof Elizabeth Jefferies

Experiment design, project management, neuroimaging analysis pipeline development

### EDUCATION

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#### PhD in Cognitive Neuroscience and Neuroimaging

*University of York*

Sept. 2015 – Dec. 2018  
York, United Kingdom

Supervisors: Prof Jonathan Smallwood and Prof Elizabeth Jefferies

Thesis: “Towards an Ontology of Ongoing Thought”

#### Master of Research in Psychology

*University of York*

Sept. 2013 – Sept. 2014  
York, United Kingdom

#### BSc in Psychology

*National Chengchi University*

Sept. 2009 – June 2013  
Taipei, Taiwan

### AWARDS AND SCHOLARSHIPS

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#### Postdoctoral scholarship

*Institut de valorisation des données (IVADO)*

May 2022 – Apr. 2024  
CA\$ 70,000

Project: Impact of age and sex on transdiagnostic brain biomarkers amongst neurodegenerative conditions

#### UNIQUE Excellence Scholarship (Declined)

*Unifying Neuroscience and Artificial Intelligence - Québec (UNIQUE)*

May 2022 – Apr. 2023  
CA\$ 20,000

Project: Impact of age and sex on transdiagnostic brain biomarkers amongst neurodegenerative conditions

#### Awards

2017 Guarantors of Brain Travel Award: Machine Learning Summer School, Tübingen, Germany (£600)

2016 The Neuro Bureau Travel Award: Brainhack Vienna, Vienna, Austria (\$500)

2014 University of York Department Summer Bursary Award (£1000)

Preprint

Peer-Reviewed Journals

- [1] H.-T. Wang, J. Smallwood, J. Mourao-Miranda, C. H. Xia, T. D. Satterthwaite, D. S. Bassett, and D. Bzdok, "Finding the needle in a high-dimensional haystack: Canonical correlation analysis for neuroscientists," *NeuroImage*, vol. 216, p. 116745, Aug. 2020. [Online]. Available: <https://linkinghub.elsevier.com/retrieve/pii/S1053811920302329>
- [2] H.-T. Wang, N. S. P. Ho, D. Bzdok, B. C. Bernhardt, D. S. Margulies, E. Jefferies, and J. Smallwood, "Neurocognitive patterns dissociating semantic processing from executive control are linked to more detailed off-task mental time travel," *Scientific Reports*, vol. 10, no. 1, p. 11904, Jul. 2020. [Online]. Available: <https://www.nature.com/articles/s41598-020-67605-2>
- [3] H.-T. Wang, D. Bzdok, D. S. Margulies, R. C. Craddock, M. P. Milham, E. Jefferies, and J. Smallwood, "Patterns of thought: Population variation in the associations between large-scale network organisation and self-reported experiences at rest," *NeuroImage*, vol. 176, no. 1, pp. 518–527, Aug. 2018. [Online]. Available: <http://linkinghub.elsevier.com/retrieve/pii/S1053811918303847>
- [4] H.-T. Wang, G. L. Poerio, C. E. Murphy, D. Bzdok, E. Jefferies, and J. Smallwood, "Dimensions of Experience: Exploring the Ontology of the Wandering Mind," *Psychological Science*, vol. 29, no. 1, pp. 56–71, Nov. 2018. [Online]. Available: <http://journals.sagepub.com/doi/10.1177/0956797617728727>
- [5] W. H. Strawson, H.-T. Wang, L. Quadt, M. Sherman, D. E. Larsson, G. Davies, B. L. Mckeown, M. Silva, S. Fielding-Smith, A.-M. Jones, and others, "Voice hearing in borderline personality disorder across perceptual, subjective, and neural dimensions," *International Journal of Neuropsychopharmacology*, vol. 25, no. 5, pp. 375–386, 2022, publisher: Oxford University Press US.
- [6] M. Del Río, C. Racey, Z. Ren, J. Qiu, H.-T. Wang, and J. Ward, "Higher Sensory Sensitivity is Linked to Greater Expansion Amongst Functional Connectivity Gradients," *Journal of Autism and Developmental Disorders*, pp. 1–19, 2022, publisher: Springer.
- [7] M. T. Sherman, H.-T. Wang, S. N. Garfinkel, and H. D. Critchley, "The Cardiac Timing Toolbox (CaTT): Testing for physiologically plausible effects of cardiac timing on behaviour," *Biological Psychology*, vol. 170, p. 108291, 2022, publisher: Elsevier.
- [8] J. Smallwood, A. Turnbull, H.-T. Wang, N. S. Ho, G. L. Poerio, T. Karapanagiotidis, D. Konu, B. Mckeown, M. Zhang, C. Murphy, D. Vatansever, D. Bzdok, M. Konishi, R. Leech, P. Seli, J. W. Schooler, B. Bernhardt, D. S. Margulies, and E. Jefferies, "The neural correlates of ongoing conscious thought," *iScience*, vol. 24, no. 3, p. 102132, 2021. [Online]. Available: <https://www.sciencedirect.com/science/article/pii/S2589004221001000>
- [9] N. S. P. Ho, D. Baker, T. Karapanagiotidis, P. Seli, H. T. Wang, R. Leech, B. Bernhardt, D. Margulies, E. Jefferies, and J. Smallwood, "Missing the forest because of the trees: slower alternations during binocular rivalry are associated with lower levels of visual detail during ongoing thought," *Neuroscience of Consciousness*, vol. 2020, no. 1, Jan. 2020. [Online]. Available: <https://academic.oup.com/nc/article/2020/1/niaa020/5917879>
- [10] A. Turnbull, T. Karapanagiotidis, H.-T. Wang, B. C. Bernhardt, R. Leech, D. Margulies, J. Schooler, E. Jefferies, and J. Smallwood, "Reductions in task positive neural systems occur with the passage of time and are associated with changes in ongoing thought," *Scientific Reports*, vol. 10, no. 1, p. 9912, Dec. 2020. [Online]. Available: <https://www.nature.com/articles/s41598-020-66698-z>
- [11] B. Mckeown, W. H. Strawson, H.-T. Wang, T. Karapanagiotidis, R. Vos de Wael, O. Benkarim, A. Turnbull, D. Margulies, E. Jefferies, C. McCall, B. Bernhardt, and J. Smallwood, "The relationship between individual variation in macroscale functional gradients and distinct aspects of ongoing thought," *NeuroImage*, vol. 220, p. 117072, Oct. 2020. [Online]. Available: <https://linkinghub.elsevier.com/retrieve/pii/S1053811920305589>
- [12] D. Konu, A. Turnbull, T. Karapanagiotidis, H.-T. Wang, L. R. Brown, E. Jefferies, and J. Smallwood, "A role for the ventromedial prefrontal cortex in self-generated episodic social cognition," *NeuroImage*, vol. 218, p. 116977, Sep. 2020. [Online]. Available: <https://linkinghub.elsevier.com/retrieve/pii/S1053811920304638>
- [13] A. Turnbull, H. T. Wang, C. Murphy, N. S. P. Ho, X. Wang, M. Sormaz, T. Karapanagiotidis, R. M. Leech, B. Bernhardt, D. S. Margulies, D. Vatansever, E. Jefferies, and J. Smallwood, "Left dorsolateral prefrontal cortex supports context-dependent prioritisation of off-task thought," *Nature Communications*, vol. 10, no. 1, Dec. 2019. [Online]. Available: <http://www.nature.com/articles/s41467-019-11764-y>

- [14] C. Murphy, G. Poerio, M. Sormaz, H.-T. Wang, D. Vatansever, M. Allen, D. S. Margulies, E. Jefferies, and J. Smallwood, "Hello, is that me you are looking for? A re-examination of the role of the DMN in social and self relevant aspects of off-task thought," *PLOS ONE*, vol. 14, no. 11, p. e0216182, Nov. 2019. [Online]. Available: <https://dx.plos.org/10.1371/journal.pone.0216182>
- [15] C. Murphy, H.-T. Wang, D. Konu, R. Lowndes, D. S. Margulies, E. Jefferies, and J. Smallwood, "Modes of operation: A topographic neural gradient supporting stimulus dependent and independent cognition," *NeuroImage*, vol. 186, pp. 487–496, Feb. 2019. [Online]. Available: <https://linkinghub.elsevier.com/retrieve/pii/S1053811918320792>
- [16] A. Turnbull, H.-T. Wang, J. W. Schooler, E. Jefferies, D. S. Margulies, and J. Smallwood, "The ebb and flow of attention: Between-subject variation in intrinsic connectivity and cognition associated with the dynamics of ongoing experience," *NeuroImage*, vol. 185, pp. 286–299, Jan. 2019. [Online]. Available: <http://www.sciencedirect.com/science/article/pii/S1053811918319414>
- [17] L. M. Martinon, L. M. Riby, G. Poerio, H.-T. Wang, E. Jefferies, and J. Smallwood, "Patterns of on-task thought in older age are associated with changes in functional connectivity between temporal and prefrontal regions," *Brain and Cognition*, vol. 132, pp. 118–128, 2019. [Online]. Available: <https://www.sciencedirect.com/science/article/pii/S0278262618303981>
- [18] K. Krieger-Redwood, H.-T. Wang, G. Poerio, L. M. Martinon, L. M. Riby, J. Smallwood, and E. Jefferies, "Reduced semantic control in older adults is linked to intrinsic dmn connectivity," *Neuropsychologia*, vol. 132, p. 107133, 2019. [Online]. Available: <https://www.sciencedirect.com/science/article/pii/S0028393219301708>
- [19] M. Sormaz, C. Murphy, H.-t. Wang, M. Hymers, T. Karapanagiotidis, G. Poerio, D. S. Margulies, E. Jefferies, and J. Smallwood, "Default mode network can support the level of detail in experience during active task states," *Proceedings of the National Academy of Sciences*, vol. 115, no. 37, pp. 9318–9323, Sep. 2018. [Online]. Available: <https://www.pnas.org/content/115/37/9318>
- [20] C. Murphy, E. Jefferies, S.-A. Rueschemeyer, M. Sormaz, H.-t. Wang, D. S. Margulies, and J. Smallwood, "Distant from input: Evidence of regions within the default mode network supporting perceptually-decoupled and conceptually-guided cognition," *NeuroImage*, vol. 171, no. 2018, pp. 393–401, May 2018. [Online]. Available: <http://linkinghub.elsevier.com/retrieve/pii/S1053811918300181>
- [21] M. Villena-Gonzalez, H. ting Wang, M. Sormaz, G. Mollo, D. S. Margulies, E. A. Jefferies, and J. Smallwood, "Individual variation in the propensity for prospective thought is associated with functional integration between visual and retrosplenial cortex," *Cortex*, vol. 99, pp. 224–234, 2018. [Online]. Available: <https://www.sciencedirect.com/science/article/pii/S0010945217303994>
- [22] G. L. Poerio, M. Sormaz, H.-T. Wang, D. S. Margulies, E. Jefferies, and J. Smallwood, "The role of the default mode network in component processes underlying the wandering mind," *Social Cognitive and Affective Neuroscience*, vol. 104, no. 7, pp. 6430–5, Mar. 2017. [Online]. Available: <https://academic.oup.com/scan/article-lookup/doi/10.1093/scan/nsx041>
- [23] D. Vatansever, D. Bzdok, H.-T. Wang, G. Mollo, M. Sormaz, C. E. Murphy, T. Karapanagiotidis, J. Smallwood, and E. Jefferies, "Varieties of semantic cognition revealed through simultaneous decomposition of intrinsic brain connectivity and behaviour," *NeuroImage*, vol. 158, no. 1, pp. 1–11, 2017. [Online]. Available: <http://www.sciencedirect.com/science/article/pii/S1053811917305384>
- [24] J. G. Sanders, H.-T. Wang, J. Schooler, and J. Smallwood, "Can i get me out of my head? exploring strategies for controlling the self-referential aspects of the mind-wandering state during reading," *Quarterly Journal of Experimental Psychology*, vol. 70, no. 6, pp. 1053–1062, 2017.
- [25] J. Smallwood, T. Karapanagiotidis, F. Ruby, B. Medea, I. de Caso, M. Konishi, H.-T. Wang, G. Hallam, D. S. Margulies, and E. Jefferies, "Representing Representation: Integration between the Temporal Lobe and the Posterior Cingulate Influences the Content and Form of Spontaneous Thought," *PLOS ONE*, vol. 11, no. 4, p. e0152272, Apr. 2016. [Online]. Available: <http://dx.plos.org/10.1371/journal.pone.0152272>

## Conference Posters

- [1] H.-T. Wang, N. Clarke, S. L. Meisler, H. Sharmarke, N. Gensollen, C. J. Markiewicz, F. Paugam, B. Thirion, and P. Bellec, "Impact of confound removal strategies on functional connectivity generated from fmriprep preprocessed data." Montreal, QC, Canada: OHBM, 7 2023.
- [2] H.-T. Wang, S. L. Meisler, H. Sharmarke, N. Clarke, N. Gensollen, C. J. Markiewicz, F. Paugam, B. Thirion, and P. Bellec, "A reproducible benchmark of fMRI denoising strategies in fMRIPrep and Nilearn," Montreal, Canada, Oct. 2022.

- [3] H.-T. Wang, S. L. Meisler, H. Sharmarke, N. Gensollen, C. J. Markiewicz, F. Paugam, B. Thirion, and P. Bellec, “Impact of confound removal strategies on functional connectivity generated from fmriprip preprocessed data.” Glasgow, United Kingdom: OHBM, 6 2022.
- [4] H.-T. Wang, C. Rae, G. Davies, C. Gould van Praag, A. Seth, H. Critchley, and S. Garfinkel, “Insula hypoactivation is associated with dissociative experiences.” Virtual Conference: OHBM, 6 2020.
- [5] H.-T. Wang, N. S. Ping Ho, D. Bzdok, B. C. Bernhardt, D. S. Margulies, E. Jefferies, and J. Smallwood, “Neurocognitive patterns dissociating semantic processing from executive control are linked to more detailed off-task mental time travel.” Seattle, USA: Neurohackademy, 8 2019.
- [6] H.-T. Wang, N. S. Ping Ho, D. Bzdok, B. C. Bernhardt, D. S. Margulies, E. Jefferies, and J. Smallwood, “Neurocognitive patterns dissociating semantic processing from executive control are linked to more detailed off-task mental time travel.” Rome, Italy: OHBM, 6 2019.

## INVITED TALKS

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- 2021 Panel speaker on neuroinformatics at University of Texas Brainstorms
- 2021 Panel speaker on academic career at MAIN 2021
- 2021 Panel speaker at SciPy2021 Biology and Neuroscience mini-symposium
- 2021 Canonical correlation analysis application in neuroimaging data, Queen's University, Kingston, Canada
- 2019 Recent trend in resting-state functional connectivity, University of Sussex, Brighton, UK
- 2019 Data simulation workshop, University of York, York, UK
- 2019 Multivariate mapping of functional brain and behaviour, Child Mind Institute, New York, USA
- 2018 Small steps to reproducible science, University of York, York, UK

## PROFESSIONAL SERVICE

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- Oct. 2021 – Sep. 2022 Hackathon Chair, Open Science special interest group, OHBM, Glasgow, UK
- Mar. 2020 – Aug. 2021 ECR representative, Sussex Neuroscience Steering Committee, University of Sussex
- Jun. 2021 OHBM Sparkle special task force, OHBM, virtual.
- Jun. 2021 Live Q & A cohost and general enquiry, OHBM Brainhack, virtual.
- Jun. 2020 Teaching assistant, OHBM Brainhack, virtual.
- Oct. 2018 – Aug. 2019 Member, Open Science Interest Group, University of York
- Oct. 2018 – Aug. 2019 Member, Early Career Researcher forum, University of York
- Mar. 2017 Organizing committee, Brainhack York, York, UK.

## AD-HOC PEER REVIEW

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Aperture Neuro, Advances in Methods and Practices in Psychological Science, Brain Imaging and Behavior, Communications Biology, Journal of Open Source Software, NeuroImage, Neuroinformatics, Neurobiology of Aging

## MEMBERSHIP

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Organization of Human Brain Mapping (OHBM); Open Science Special Interest Group, OHBM.

## OPEN SOURCE SOFTWARE CONTRIBUTIONS

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- [NiLearn](#): Core developer.
- [load\\_confounds](#): Core developer.
- [Brainhack book](#): csv to markdown table parser for website and code review.
- [Pydra-FSL](#): FSL wrapped with python workflow engine; nipy 1 to pydra interface converter.
- [NiBabel](#): GIFTI data reading method

## TECHNICAL EXPERTISE

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**Overview:** Functional magnetic resonance imaging, neuroinformatics, multivariate analysis.

### Technologies

*Neuroimaging:* FSL, fMRIPrep, Freesurfer, Connectome Workbench, Brain Image Data Structure (BIDS), nipy

*Statistics:* nilearn, scikit-learn, JASP

*Experiment design:* PsychoPy

*Research computing:* container (docker, singularity), cluster computing (SGE), version control (git, github)

### Programming Languages

Proficient: Python2/3, shell. Competent: L<sup>A</sup>T<sub>E</sub>X, MATLAB. Familiar: R, JavaScript.

## MENTORING EXPERIENCE

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### PhD

2019–2021 Will Strawson University of Sussex (with Prof. Sarah Garfinkle)

### MSc

2019 Bronte McKeown, Will Strawson University of York (with Prof. Jonathan Smallwood)

2018 Delali Konu, Rebecca Lowndes University of York (with Dr. Charlotte Murphy and Prof. Jonathan Smallwood)

## TEACHING EXPERIENCE

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### UNIQUE educational workshop

December 2022

Instructor of the two day neuro-AI workshop.

### Brainhack School

July 2022

Instructor of the one-month data science bootcamp for neuroscientists.

### UNIQUE educational workshop

November 2021

Instructor of the two day neuro-AI workshop.

### OHBM Brainhack

June 2020

Brain Image Data Structure teaching assistant.

### University of York

October – March 2016

*Programming in Neuroimaging*

*York, United Kingdom*

Teaching assistant: Basic Python, data visualisation, PsychoPy, data analysis, and shell scripting.

## PROFESSIONAL DEVELOPMENT

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Aug. 2019 Neurohackademy, Seattle, USA.

Dec. 2017 Large-scale trends in cortical organization, Leipzig, Germany.

June 2017 Machine Learning Summer School, Tübingen, Germany.

Sep. 2016 Brainhack Vienna, Vienna, Austria.

Feb. 2016 Brainhack@Paris, Paris, France.

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