FLORIAN BURGER

Email: fburger20@gmx.de
Location: Sydney, Australia
ORCID: 0009-0007-3394-7574
LinkedIn: https://www.linkedin.com/in/florian-burger-2a93bb146/

Research Profile

I am a PhD student in cognitive neuroscience working at the intersection of neuroimaging, computational modelling, and theoretical approaches to representation. My work uses fMRI and EEG together with multivariate and representational analyses to study how visual information is structured in the brain, informed by deep neural network models. I am broadly interested in hierarchical processing, systems neuroscience, and principled links between biological and artificial intelligence.

Education and Qualifications

2025-Present: PhD Candidate in Cognitive Neuroscience (anticipated completion in January 2028)
MARCS Institute for Brain, Behaviour, and Development, Western Sydney University, Sydney, Australia.
Thesis Title*: Visual Dimensions Underlying Object Recognition*
Supervisors: Tijl Grootswagers, Genevieve Quek, Manuel Varlet
Techniques and skills:

1. Neuroimaging
2. Deep Neural Networks
3. Decoding/MVPA
4. Academic Writing

2022-2024: Research Master in Psychology
School of Psychology, University of Amsterdam, Amsterdam, The Netherlands
Thesis Title*: The Effect of Increased Arousal on Brain States: An Investigation Using a Machine Learning Approach*
Supervisor: Simon van Gaal
Major: Brain & Cognition
Minor: Psychological Methods
Techniques and skills:

1. Neuroimaging
2. Systems Neuroscience

2018-2021: BSc in Psychology
School of Psychology, University of Amsterdam, Amsterdam, The Netherlands
Thesis Title*: Second-Language Acquisition Using Colour: A Grapheme-Colour Synaesthesia Informed Approach*
Techniques and skills:

1. Online Data Collection
2. Statistical Analysis

Academic Awards

2025: Western Sydney University Postgraduate Research Scholarship
2025: Best Student Poster Award, Experimental Psychology Conference (EPC)
2025: Best Graduate Student Poster Award, Australasian Cognitive Neuroscience Society (ACNS) Conference

Professional Affiliations

2022: School of Psychology, University of Cambridge, Cambridge, United Kingdom
2025-Present: MARCS Institute for Brain, Behaviour and Development, Western Sydney University, Sydney, Australia
2025-Present: School of Medicine, University of Sydney, Sydney, Australia

Languages

English – C2
German – Native

Other Research Experience

January-August 2022: Research Intern at University of Cambridge
Part-time/full time (20 hours a week for 4 months, 40 hours a week for 2 months) Research Intern under Andres Canales-Johnson at the Department of Psychology. Investigating inter-cortical connectivity in early visual areas by applying information theory and MVPA to ECoG data.

January-July 2022: Research Intern at University of Sydney
Part-time (20 hours) Research Intern at the Sydney Computational Cognitive Neuroscience Lab under Tom Carlson improving the accuracy of EEG-MVPA analysis to visual stimuli by limiting the temporal dimension of EEG data.

Teaching Experience and Outreach

2022-2024: Tutor in a variety of statistic courses in the Department of Psychology and PPLE:
Teaching first year statistics courses introducing students to relevant statistical concepts.
2023-2024: Bachelor Thesis Supervisor
Leading a project called "Personality and other predictors of climate change anxiety" grading the students, dealing with ethics/ethical approval, setting up the questionnaire, and other tasks related to lead to a successful research project. I also gave a 10-minute guest lecture in the course "Current Topics: A Clinical Perspective on Today's Issues" introducing the students to climate change anxiety and its relevance.

Service

2025-Present: Student Representative on the Research Council of the MARCS Institute for Brain, Behaviour, and Development
Peer Reviewer: Nature Communications (1 manuscript)

Relevant Employment History

2025-Present: Research Assistant at University of Sydney

Research Assistant in the Shine Lab involved in a variety of projects:

1. Building a comprehensive analysis pipeline including a variety of methods including energy landscape and dynamic model decomposition for neural data.
2. fMRI pre-processing pipeline including MRIQC, fMRIPrep, and denoising.
3. Creation of relevant null models to improve reliability of used method.

Research Outputs Summary

During my PhD I have submitted 1 paper as first author and presented my work at one international and two national conferences. I have also given one invited seminar. See appendix for details.

Referees

Dr. Tijl Grootswagers (ARC DECRA Senior Research Fellow)
MARCS Institute for Brain, Behaviour, and Development, Western Sydney University, Sydney, Australia
Email: t.grootswagers@westernsydney.edu.au
Relationship: Principal Supervisor of my PhD

Dr. Mac Shine (Professor)
School of Medicine, University of Sydney, Sydney, Australia
Email: mac.shine@sydney.edu.au
Relationship: Supervisor of research assistant position

Appendix of Research Outputs

Publications

2025

Roberts, L., Äijälä, J., Burger, F., Uran, C., Jensen, M. A., Miller, K. J., ... & Canales-Johnson, A. (2025). Broadband synergy versus oscillatory redundancy in the visual cortex. *bioRxiv*, 2025-02. *In review at Nature Communications*

Burger, F., Varlet, M., Quek, G. L., & Grootswagers, T. (2025). Hierarchical Emergence Profiles of Human-Derived Dimensions are a Fundamental Property of Deep Neural Networks. *bioRxiv*, 2025-05. *In review at PLOS Computational Biology*

Invited Talks & Seminars

2025

Invited Speaker at the Information in Silicons & Neurons Workshop at Macquarie University organised by Andrew Barron

Conferences

2025

Poster Presentation, Experimental Psychology Conference (EPC), University of New South Wales, Sydney, Australia

Poster Presentation, Cognitive Computational Neuroscience Conference, University of Amsterdam, Amsterdam, The Netherlands

Poster Presentation, Australasian Cognitive Neuroscience Society Conference, Monash University & Deakin University, Melbourne, Australia