João Barbosa

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Academic Positions

2025–present	**INSERM Researcher**	Neuromodulation Institute and NeuroSpin, Paris
2024–2025	**Junior group leader**	Neuromodulation Institute and NeuroSpin, Paris
2023	**Visiting Researcher**	Williams lab, Center for Computational Neuroscience at the Flatiron Institute
2020–2024	**Postdoc**	Ostojic lab, Group for Neural Theory, École Normale Supérieure
2019–2020	**Postdoc**	Compte lab, Theoretical Neurobiology, IDIBAPS
2016	**Visiting Researcher**	Buschman lab, Princeton University

Education

2013–2019	**PhD**	Computational Neuroscience, Universidad de Barcelona *Advisor: Albert Compte*
Gap Year	Mexico	
2009–2011	**MSc**	Bioinformatics, Università di Bologna
2006–2009	**BSc**	Computer Science, Universidade do Minho & Universiteit van Amsterdam

Teaching

3.1 Course co-director

2025–present	**Course co-director**	Computational Neuroscience at Cognitive Science Master *(ENS, Paris)*

3.2 Invited lecturer

2025–present	**Invited lecturer**	Model-based Neuroimaging at Cognitive Science Master *(Paris Cité)*
2025–present	**Invited lecturer**	Interplay between Deep Learning and Cognitive Science course, part of the ENS/EHESS Master in Cognitive Science

3.3 Short courses

2025	**Faculty**	Computational and Cognitive Neuroscience Summer School (China)
2025	**Faculty**	BioRTC Simons Computational Neuroscience Course (Nigeria)
2024	**Teacher**	PSL-QLife Winter School Quantifying and Modeling Plasticity in Neuronal Networks (Paris)
2023	**Teaching Assistant**	Machine learning for neuroscience summer school, Champalimaud Centre for the Unknown, (Portugal)

2019	**Teaching Assistant**	Computational and Cognitive Neuroscience Summer School (China)
2016	**Teaching Assistant**	Introduction to Python at Master in Brain and Cognition (Universitat Pompeu Fabra, Barcelona)

Selected Publications

4.1 Peer-reviewed articles

Barbosa J$^{\checkmark}$, Proville R, Rodgers CC, DeWeese MR, Ostojic S, Boubenec Y. Early selection of task-relevant features through population gating. *Nature Communications* 14, 6837 (2023).
Barbosa J, Lozano-Soldevilla D, Compte A. Pinging the brain with visual impulses reveals electrically active, not activity-silent working memories. *PLoS Biology* 19(4): e3001436 (2021).
Barbosa J, Babushkin V, Temudo A, Sreenivasan KK, Compte A. Across-area synchronization supports feature integration in a biophysical network model of working memory. *Frontiers in Neural Circuits* 15:716965 (2021).
Barbosa J^{+}, Stein H^{+}, Martinez RL, Galan-Gadea A, Li S, Dalmau J, Adam KCS, Valls-Solé J, Constantinidis C, Compte A. Interplay between persistent activity and activity-silent dynamics in prefrontal cortex underlies serial biases in working memory. *Nature Neuroscience* 23(8): 1016-1024 (2020).
Stein H^{+}, **Barbosa J**$^{+}$, Rosa-Justicia M, Prades L, Morató A, Galan-Gadea A, Ariño H, Martinez-Hernandez E, Castro-Fornieles J, Dalmau J, Compte A. Synaptic basis of reduced serial dependence in anti-NMDAR encephalitis and schizophrenia. *Nature Communications* 11, 4250 (2020).
Barbosa J, Compte A. Build-up of serial dependence in color working memory. *Scientific Reports* 10, 10959 (2020).
Almeida R, **Barbosa J**, Compte A. Neural circuit basis of visuo-spatial working memory precision. *Journal of Neurophysiology* 114(3): 1806-1818 (2015).

4.2 Preprints

Barbosa J, Nejatbakhsh A, Duong L, Harvey SE, Brincat SL, Siegel M, Miller EK, Williams AH. Quantifying Differences in Neural Population Activity With Shape Metrics. *bioRxiv* (2025).
Tschiersch M, Umakantha A, Williamson RC, Smith MA, **Barbosa J**$^{+}$, Compte A^{+}. Redundant, weakly connected prefrontal hemispheres balance precision and capacity in spatial working memory. *bioRxiv* (2025).
Stein H, **Barbosa J**, Lozano-Soldevilla D, Rosa-Justicia M, Morató A, Galan-Gadea A, Prades L, Muñoz-Lopetegui A, Ariño H, Martinez-Hernandez E, Guasp M, Castro-Fornieles J, Dalmau J, Santamaria J, Compte A. Neural signatures of reduced serial dependence in anti-NMDAR encephalitis and schizophrenia. *PsyArXiv* (2024).

4.3 Reviews

Barbosa J$^{\checkmark +}$, Stein H^{+}, Zorowitz S, Niv Y, Summerfield C, Soto-Faraco S, Hyafil A. A practical guide for studying human behavior in the lab. *Behavior Research Methods* 54(1): 58-76 (2022).
Stein H^{+}, **Barbosa J**$^{+}$, Compte A. Towards biologically constrained attractor models of schizophrenia. *Current Opinion in Neurobiology* 70: 54-62 (2021).
Barbosa J$^{\checkmark}$. Working Memories Are Maintained in a Stable Code. *Journal of Neuroscience* 37(39): 9315-9317 (2017).

Conference Presentations

Abdul LS, Brincat SL, Miller EK, **Barbosa J**. Task-Relevant Information is Distributed Across the Cortex, but the Past is State-Dependent and Restricted to Frontal Regions. *Cognitive Computational Neuroscience* (2025).
Barbosa J, Valente A, Brincat SL, Miller EK, Ostojic S. Estimating flexible across-area communication with neurally-constrained RNN. *Cognitive Computational Neuroscience* (2024).

Grants & Awards

Principal Investigator
- INSERM Research Position (2025-present)
- Junior Group Leader Position, Neuromodulation Institute (2024-2025)

Professional Service

Reviewer: Nature Neuroscience, eLife, Journal of Neuroscience, PLoS Computational Biology, Neural Computation
Organization: Co-organizer of Bernstein Workshops (2025): Machine learning for constraining interpretable models & Top-down control of neural dynamics

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$^{+}$ equal contributions, ✓ corresponding author
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