

# **Dr Natasha L. Taylor (PhD)**

National University of Singapore

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## **PROFESSIONAL SUMMARY**

Neuroscientist with over 6 years of experience analyzing high-dimensional time-series datasets using Python, MATLAB and R. Expertise in statistical and predictive modelling, low-dimensional embeddings, feature extraction and signal processing of large multi-modal datasets. Proven record in developing automated analytical pipelines, predictive feature extraction with proven clinical outcomes and delivering reproducible insights. Seeking to apply advanced analytical expertise in an industry-partnered role for translatable impact.

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## **TECHNICAL SKILLS**

**Programming Languages:** Python, MATLAB, R, Bash

**Data Science & Machine Learning:**

Machine learning, classification, regression, feature selection, dimensionality reduction

**Statistical & Time-Series Analysis:**

Time-series analysis, signal processing, statistical modeling, correlation analysis, dynamic systems analysis, network analysis

**Data Engineering & Workflow Tools:**

Git, Linux, HPC environments, automated pipeline development, reproducible workflows

**Data Visualization:**

Scientific visualization, multidimensional data visualization

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## **PROFESSIONAL EXPERIENCE**

### **Postdoctoral Research Fellow**

National University of Singapore | 2025 – Present

- Developed statistical analysis pipelines to analyze high-dimensional multi-modal datasets
  - Designed automated data processing workflows, improving efficiency and reproducibility for large timeseries datasets
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### **Postdoctoral Research Associate**

The University of Sydney | 2024 – 2025

- Built predictive models to identify biomarkers associated with clinical outcomes
- Collaborated with interdisciplinary teams including clinicians, engineers, and data scientists
- Designed computational models to analyze dynamic patterns in large-scale datasets
- Developed automated pipelines in Python and MATLAB for processing and analyzing high-dimensional data
- Applied statistical modeling and machine learning methods to identify predictive features
- Published findings in high-impact scientific journals

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## PhD Researcher

The University of Sydney | 2019 – 2024

- Developed novel statistical approaches for analyzing complex time-series datasets
  - Built automated pipelines to process large-scale neuroimaging datasets
  - Applied predictive modeling to identify relationships between biological signals and clinical outcomes
  - Published 15+ peer-reviewed research papers
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## EDUCATION

- 2024: Doctor of Philosophy (neuroscience), Faculty of Medicine & Health, The University of Sydney.
  - 2019: Bachelor of Medical Science (First Class Honours), The University of Sydney.
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## SELECTED PUBLICATIONS

- **Taylor, N.L.**, Munn, B.M., Gjini, K., Orlando, I.F., Moran, B., Taylor, J., Wehrmann, J., Banks, M.I., Nair, V., Pearce, R.A., Kunkel, D., Prabhakaran, V., Lennertz, Shine, J.M., R., Sanders, R.D. (2026). 'Preoperative Cholinergic Signatures Drive Segregated Brain Architecture in Postoperative Delirium'. (*Under Review*).
- **Taylor, N.L.**, Wehrman, J., Banks, M.I., Nair, V., Pearce, R.A., Kunkel, D., Shine, J.M., Prabhakaran, V., Lennertz, R., Sanders, R.D. (2026). 'Dysfunctional Resting-state Network Connectivity predicts postoperative delirium after major surgery'. *BJA* (<https://doi.org/10.1016/j.bja.2025.11.036>).
- **Taylor, N.L.**, Whyte, C.J., Munn, B.R., Chang, C., Lizier, J.T., Leopold, D., Zaborszky, L., Müller, E.J., Shine, J.M. (2024). 'Causal evidence for cholinergic stabilisation of attractor landscape dynamics'. *Cell Report* ([10.1016/j.celrep.2024.114359](https://doi.org/10.1016/j.celrep.2024.114359)).
- **Taylor, N.L.**, D'Souza, A., Munn, B.R., Lv, J., Zaborszky, L., Müller, E.J., Wainstein, G., Calamante, F., Shine, J.M. (2022) 'The Structural and Functional Connectivity of Neuromodulatory systems underpins dynamic shifts in brain network topology and attractor landscape topography'. *NeuroImage*, ([10.1016/j.neuroimage.2022.119455](https://doi.org/10.1016/j.neuroimage.2022.119455)).
- **Taylor, N. L.**, Wainstein, G., Quek, D., Lewis, S.J.G., Shine, J.M., and Ehgoetz Martens, K.A. (2022). 'The Contribution of Noradrenergic Activity to Anxiety-Induced Freezing of Gait'. *Movement Disorders*, ([10.1002/mds.28999](https://doi.org/10.1002/mds.28999)).

*Full publication list available upon request.*

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## AWARDS

- 2023: Emerging Aspirations Award from Centre for Complex Systems, The University of Sydney.  
2023: James Kentley Memorial Funds Scholarship, \$5,300, The University of Sydney.  
2022: Nominee for CSL Florey Next Generation Award, \$50,000.  
2021: Research Training Program Stipend Scholarship, \$35,950 (p.a.), The University of Sydney.  
2019: Honours Research Physiology Scholarship, \$8,000, The University of Sydney.
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GitHub: <https://github.com/NatashaLTaylor>

Website: <https://natashaltaylor.github.io/>