MOLLY SIMMONITE PHD

RESEARCH SCIENTIST

1530 Ferdinand St, Detroit, MI | mollysimmonite@gmail.com | +1 734 680 3451

SUMMARY

Research Scientist with 15+ years of experience analyzing noisy biological time-series data from human studies. Focused on extracting stable, interpretable signals through rigorous quality control, reliability assessment, and multivariate and predictive modeling across repeated measurements. Experienced in longitudinal and interventional study design, validation against behavioral and clinical outcomes, and reproducible, IRB-governed analysis workflows for complex physiological data.

CORE SKILLS

- Neurobiological time-series analysis and quality control for EEG and neuroimaging data
- Multivariate and predictive modeling of high-dimensional physiological data (kNN, SVM, MVPA)
- Feature selection and cross-validation to assess model generalization and robustness
- Reliability and validation of candidate biomarkers using test–retest and longitudinal approaches
- Interpretation of model outputs in relation to neurobiology and behavioral or clinical outcomes
- Multimodal integration of physiological and behavioral data in IRB-governed, reproducible workflows (R, Python, MATLAB)

PROFESSIONAL EXPERIENCE

University of Michigan, Ann Arbor, MI, Departments of Psychiatry and Psychology
Assistant Research Scientist (2025 - Present)
Research Investigator (2022 - 2025)
Postdoctoral Research Fellow (2016 - 2022)

- Led the analytical strategy for a long-running (10+ year) human aging research program with 500+ participants, including multimodal physiological and behavioral data collection across repeated visits and multi-year follow-up.
- Applied cross-validated multivariate and predictive models (k-nearest neighbors, support vector machines, and multivariate pattern analysis) to dense EEG and fMRI time-series data to identify reliable individual-level patterns and assess generalization across sessions, tasks, and longitudinal change.
- Developed precision neuroimaging and neurophysiological analysis approaches using dense repeated sampling to quantify within-person variability, distinguish stable signal from noise, and inform feature selection for individual-level inference.

- Directed analysis for observational and interventional clinical studies, including pharmacological and biospecimen protocols, under complex IRB oversight and in collaboration with clinicians and multidisciplinary research teams.
- Designed and implemented stringent quality-control pipelines for neurobiological data and validated derived physiological measures against independent behavioral and clinical outcomes.

Postdoctoral Research Fellow, Rosalind Franklin University of Medicine & Science, North Chicago IL
Adjunct Research Scientist, Mind Research Network, Albuquerque, NM
2013 - 2016

- Conducted and coordinated cross-site analysis of neuroimaging and EEG data for studies using a mobile MRI scanner in incarcerated populations under complex IRB and multi-site operational constraints
- Mentored a PhD trainee in EEG analysis resulting in a first-author peer-reviewed publication

TEACHING AND LEADERSHIP

Lecturer, University of Michigan, Ann Arbor, MI 2019 - Present
Developed and served as primary instructor for a 400-level course covering neurochemistry of behavior, aging, and mental health—including sleep, circadian rhythms, and stress physiology—and a 200-level introductory course (300+ students), managing undergraduate and postgraduate teaching assistants responsible for discussion sections

EDUCATION

- **PhD in Psychiatry,** University of Nottingham, (UK)
- **MS in Cognitive Neuroscience and Neuroimaging,** University of Nottingham, (UK)
- **BS (Hons) in Psychology,** University of Lincoln, (UK)

SELECTED PUBLICATIONS

For full publication list, see Google Scholar profile

- Michon, K. J., Zhou, Q., Osborne, J. B., Beltz, A. M., Jonides, J., **Simmonite, M.**, et al., (in press). Brain activation during cognitive control tasks differs substantially between people but is reliable within individuals. Imaging Neuroscience.
- Michon, K. J., Khammash, D., **Simmonite, M.**, Hamlin, A. M., & Polk, T. A. (2022). Person-specific and precision neuroimaging: Current methods and future directions. NeuroImage, 263, 119589.
- **Simmonite, M.**, & Polk, T. A. (2022). Age-related declines in neural distinctiveness correlated across brain areas and arise from decreased reliability and increased confusability. Aging, Neuropsychology, and Cognition, 29(3), 483–499.
- **Simmonite, M.**, Khammash, D., Michon, K. J., Hamlin, A. M., Taylor, S. F., Meehan, S. K., et al., (2024). Age and visual cortex inhibition: A TMS–MRS study. Cerebral Cortex, 34(9).
- Cassady, K., Gagnon, H., Lalwani, P., **Simmonite, M.**, Peltier, S., Seidler, R. D., et al., (2019). Sensorimotor network segregation declines with age and is linked to GABA and performance. NeuroImage, 186, 234–244.