

"Post-Doctoral Fellowship in Reproducible Neuroimaging Analysis"

The Krembil Centre for Neuroinformatics (PI **Dr. Sean Hill**, <http://krembilneuroinformatics.ca/>) Toronto, is looking to hire a Post-Doctoral Fellow with a strong background in Neuroimaging and Software Engineering. The successful candidate shall spearhead the group's efforts in developing a comprehensive open science platform that captures a range of experimental data, produces a semantic representation that links related scientific content, and provides users with data discovery tools.

Working jointly between the Krembil Centre and Radiologics, the successful candidate will be involved cutting-edge development an electronic laboratory notebook platform that enables reproducible human neuroscience workflows. This work will support a global collaborative effort for [**Accelerating research on Consciousness: An adversarial collaboration to test contradictory predictions of Global Neuronal Workspace and Integrated Information Theory**](#). **Led by Dr. Lucia Melloni** this project will accelerate research on consciousness by providing decisive, field-transformative evidence in favor of one theory and against the other. It will also establish a groundbreaking model for scientific practices in cognitive neuroscience at large, by demonstrating the impact of team-based adversary research and open data. This will address major riddles in the field, much like established practices in other fields such as physics and genomics have done. Thus, this project may dramatically change the landscape of research—that is, the social practices and norms—in the field of cognitive neuroscience.

<https://www.templetonworldcharity.org/projects-database/accelerating-research-consciousness-adversarial-collaboration-test-contradictory>

The platform will enable researchers to define their experiment protocols, capture and manage experiment metadata associated with these protocols, and publish the resulting data sets to a semantically enabled search engine. The platform will provide the basis for creating interactive publications from which each analysis result and figure is linked through structured provenance record to its original source data and analysis pipelines.

- To develop an open source electronic laboratory notebook to support reproducible analysis of data that encompasses the most commonly used techniques in human neuroscience: fMRI, MEG, EEG and ECoG.
- To develop standards for data annotation and exchange of data and metadata.
- To publish those metadata via a semantically-enabled search engine.
- The platform will build on several key components. The e-notebook will advance the pilot software currently in development and will include a user-friendly app-based interface to define the structure and content of experiments including the most common cognitive neuroscience experimental methods (fMRI, EEG, MEG, and ECoG).
- The system will integrate XNAT, developed in Dr. Marcus' laboratory at Washington University and at Radiologics (Marcus et al, 2007) and Blue Brain Nexus (bluebrainnexus.io) platform developed by a team led by Dr. Hill (Kaufmann et al., 2018). XNAT and Nexus are widely-used, open source applications that have been instrumental in advancing reproducible science.

The successful candidate will have a PhD in neuroscience, engineering, physics, psychology, or related area, a track record for independent research, and a strong publication record. Strong programming

skills and familiarity with neuroimaging data (s/d/fMRI and/or M/EEG) are required; experience with software development, semantic databases and data models are advantageous.

For inquiries, please email Dr. Sean Hill (Sean.Hill@camh.ca) with the title "Post-Doctoral Fellowship Reproducible Neuroimaging Platform" in the subject line."