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Type: **Hands-on session**

An open access software ecosystem for multiscale neuroscience

Wednesday 4 October 2023 13:00 (1h 30m)

Hands-on session: From BigBrains to BrainSpaces: open tools to integrate histology, imaging, and macroscale connectivity

The human brain is a complex system, which can be studied from multiple different angles: As microscopic neurons form intricate webs of connections, a structural backbone emerges to support communication across anatomically distant brain areas. As such, considering both brain anatomy and function across several scales of investigation promises to lead to a more complete understanding of this organ. By highlighting the need to study the brain in a more integrated manner, this perspective has required a significant shift in the way we collect and analyze brain data. This hands-on session will showcase open software and data resources facilitating such investigations, with a particular emphasis on multiscale methods bridging histology, neuroimaging, and macroscale brain networks in humans. Following a brief overview of relevant tools, participants will be guided through the application of these methods via microstructure-informed investigations of functional brain network organization and statistical analysis of multimodal imaging features.

Session requirements

This session will mainly rely on Google Colab, allowing participants to execute notebooks prepared for this session and by-passing any system-based or installation requirements. Although prior knowledge of Bash and Python is an asset, this is not a requirement. Participants will have the option of providing their own neuroimaging data mapped to the fs-LR 32k-vertex neocortical surface template for processing and analysis in the provided notebook, but processed data will be provided for all participants to use. Further information on how to set up the participants' own environment will be provided.

Presenters: RODRIGUEZ-CRUCES, Raúl (Montreal Neurological Institute, McGill University, Montreal, Canada); ROYER, Jessica (McGill University); BERNHARDT, Boris (McGill)

Session Classification: Hands-on session 2B