

THE VIRTUAL BRAIN



Randy McIntosh

Senior Scientist at the Rotman Research Institute and a Professor of Psychology at the University of Toronto

Dr McIntosh's work links cognitive and theoretical neuroscience by emphasizing how network operations give rise to human mental processes.

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11:00 AM EST (1.5 hours long)

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Abstract:

The Virtual Brain (TVB: thevirtualbrain.org) is a simulation platform that can be run on any laptop but is also scalable to High-Performance Computing clusters. It has over 18,000 downloads worldwide. TVB is an open-source platform that can integrate neuroimaging data to create large-scale models of the brain. The initial applications demonstrated how the intersection of brain connectomics and noise could explain intrinsic network dynamics that are characteristic of "resting-state networks", and that the intersection sets an optimal working point for cognition. Subsequent work focused on clinical extensions, one showing how personalized models in stroke could predict responses to therapy and a second showing the added predictive power of personalized models in Alzheimer's dementia. Extensions of TVB have also been central to guiding interventions in epilepsy. Finally, the flexibility of the informatics architecture makes TVB an ideal integrative platform for animal models and human work, with recent TVB versions designed for rodent and non-human primate data.

Dr Randy McIntosh is a Senior Scientist at the Rotman Research Institute and a Professor of Psychology at the University of Toronto. He helped secured the initial investment to bring together computational, cognitive and clinical neuroscientists to establish The Virtual Brain.



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sabina.hamalova@mcgill.ca or visit www.mcgill.ca/desautels/mcche