

NEURAL ENGINEERING SEMINAR SERIES

Computational and theoretical modelling of neurostimulation: connectivity, plasticity, personalized brain simulations, and insights into principles of brain organization

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108 Wartik Laboratory



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ABSTRACT:

Noninvasive brain stimulation techniques are an important family of tools for both basic neuroscience research and therapeutic interventions. Computational modelling of neurostimulation responses can aid enormously in their design and administration. Combining multimodal neuroimaging measurements with mathematical models of neural population dynamics also allows the building of subject-specific personalized brain stimulation models. In this talk I offer a synthesis of my group's (grifflab.com) work in this area, studying questions such as the connectivity structure of TMS target sites, recurrent feedback in evoked responses, and the modulation of synaptic weights by plasticity mechanisms.

BIOGRAPHY:

Dr. Griffiths is a cognitive and computational neuroscientist, with particular research interests in mathematical modelling of large-scale neural dynamics, multimodal neuroimaging data analysis methods, and brain stimulation in the context of neuropsychiatric and neurological disease. He is a Scientist at the Krembil Centre for Neuroinformatics at CAMH, where he leads a team focused on whole-brain neurophysiological modelling. An Assistant Professor in the UToronto Department of Psychiatry, Dr. Griffiths obtained his PhD in Cognitive Neuroscience from the University of Cambridge, subsequently holding postdoctoral positions at the University of Sydney, Baycrest, and Toronto Western Hospitals.