

NODE

#7

WORKSHOP

AUGUST 7-8, 2018

MONTREAL, QC, CANADA

SUPPORTED BY



In the workshop we will explain the fundamental principles of full brain network modeling using the open source neuroinformatics platform The Virtual Brain (TVB). This simulation environment enables the biologically realistic modeling of network dynamics using connectome-based approaches across different brain scales. Configurable brain network models generate macroscopic neuroimaging signals including functional MRI, intracranial and stereotactic EEG, surface EEG and MEG for single subjects. Researchers from different backgrounds can benefit from an integrative software platform including a supporting framework for data management (generation, organization, storage, integration and sharing) and a simulation core written in Python.



THEVIRTUALBRAIN.

FOR MORE INFO

WWW.THEVIRTUALBRAIN.ORG

Get up to speed about the fundamental principles of full brain network modeling using the open source neuroinformatics platform The Virtual Brain (TVB).

DAY ONE - TUESDAY AUGUST 7

08:30 - 09:00 **Arrival, registration & caffeine intake**

09:00 - 09:15 **Introduction**

09:15 - 10:45 **A generative model of the brain**

Describing the building blocks of a brain network model basic principles and assumptions,
recent studies with different local models approximation of neural fields

RANDY MCINTOSH (Baycrest, Toronto)

10:45 - 11:00 **Coffee break**

11:00 - 11:45 **Architecture of TVB**

Overview of the software architecture of The Virtual Brain

PAULA POPA & MIHAI ANDREAI (Codemart)

11:45 - 12:30 **Hands-On: Interacting with TVB using GUI**

Learn to prepare and run TVB simulations through web interface

PAUL TRIEBKORN (Charité, Berlin)

12:30 - 13:30 **Lunch break**

13:30 - 14:15 **Use Case: Interacting with TVB using CLI**

Introduction to the Python interface of TVB

PAUL TRIEBKORN (Charité, Berlin)

14:15 - 15:00 **Modelling brain dynamics at rest**

Introduction to theory and practice of modelling M/EEG and fMRI resting state dynamics

JOHN GRIFFITHS (Baycrest, Toronto)

15:00 - 15:15 **Coffee break**

15:15 - 16:00 **Modeling brain stimulation and mouse brains**

Modeling brain stimulation and exploring their dynamics

ANDREAS SPIEGLER (Charité, Berlin)

16:00 - 16:45 **Hands-On: Modeling brain stimulation**

How to simulate brain stimulation

PAUL TRIEBKORN (Charité, Berlin)

16:45 - 17:30 **Hands-On: Modeling mouse brains**

How to simulate mouse brains

PAUL TRIEBKORN (Charité, Berlin)

17:30 - 18:00 **Recap & open discussion**

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DAY TWO - WEDNESDAY AUGUST 8

09:00 - 09:15 **Morning caffeine**

9:15 - 10:00 **From imaging data to TVB datasets: conceptual introduction**
Overview of neuroimaging data formats, software, & steps to get TVB-compatible datasets
PETRA RITTER (Charité, Berlin)

10:00 - 10:45 **From imaging data to TVB datasets: practical**
Practical example of processing the neuroimaging data and import to TVB
PETRA RITTER (Charité, Berlin)

10:45 - 11:00 **Coffee break**

11:00 - 11:45 **Clinical applications of TVB**
From stroke to Alzheimer's Disease

ANA SOLODKIN (UC Irvine, California)

11:45 - 12:30 **Hands-On: Modeling stroke**
Modeling stroke
JOHN GRIFFITHS (Baycrest, Toronto) & ANA SOLODKIN (UC Irvine, California)

12:30 - 13:30 **Lunch break**

13:30 - 14:15 **Using TVB for epilepsy**
Examples clinical applications of TVB
JULIE COURTIOL (Charité, Berlin)

14:15 - 15:00 **Hands-On: Modeling epilepsy**
Simulating epilepsy
PAUL TRIEBKORN (Charité, Berlin)

15:00 - 15:15 **Coffee break**

15:15 - 16:00 **Precision Medicine**
Uncovering cellular mechanisms of Alzheimer's Disease with TVB
ANA SOLODKIN (UC Irvine, California)

16:00 - 17:00 **Hands-On: Modifying TVB code and implementing new features**
A guide on how to add new neural mass model, integration scheme, or a monitor to TVB
JULIE COURTIOL (Charité, Berlin)

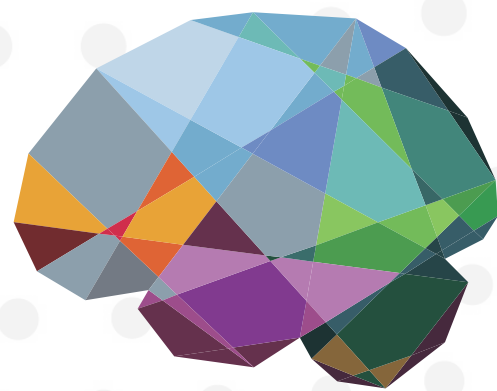
17:00 - 17:30 **Final discussion & closing remarks**



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