NODE#5 MARSEILLE
## PRACTICAL BRAIN NETWORK MODELING

**MAY
15/16
2017**

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

TVB enables biologically realistic modeling of network dynamics using Connectome-based approaches across different brain scales.

Generate macroscopic neuroimaging signals incl. fMRI, intracranial and stereotactic EEG, surface EEG and MEG for single subjects.

A workshop hosted by the TVB team at:
Aix-Marseille University
Faculty of Medicine at La Timone
27 Boulevard Jean Moulin, Pedagogical Building, Room 202
13005 Marseille, France
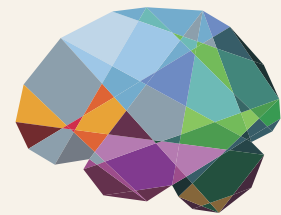
THEVIRTUALBRAIN.

MORE INFORMATION & REGISTRATION:
WWW.THEVIRTUALBRAIN.ORG/NODE5

PROGRAM / MAY 15
MORNING SESSION

08:30 - 09:00
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

10:45 - 11:00
Coffee break

11:00 - 11:45
Architecture of TVB
Overview of the software architecture of The Virtual Brain

11:45 - 12:30
Hands-on: Interacting with TVB using GUI
Learn to prepare and run TVB simulations through web interface

12:30 - 13:30
Lunch break

PROGRAM / MAY 15
AFTERNOON SESSION

13:30 - 14:15
Hands-on: Interacting with TVB using CLI
Introduction to the Python interface of The Virtual Brain

14:15 - 14:55
From imaging data to TVB datasets: conceptual introduction
Overview of the neuroimaging data formats, software, and steps to get TVB-compatible datasets

14:55 - 15:10
Coffee break

15:10 - 16:00
From imaging data to TVB datasets
Practical example of processing the neuroimaging data

16:00 - 16:40
Hands-on: Further topics in preprocessing imaging data
How to obtain gain matrices for MEG, EEG and sEEG recordings

Optional: **16:40 - 17:20**
Hands-on: Bring your own data: preprocessing
Hands-on session for participants with their own data

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PROGRAM / MAY 16
MORNING SESSION

08:30 - 09:00
Morning caffeine

09:00 - 09:45
Data fitting: theoretical background
Fitting the model outputs and the measurements: parameter sweeps, Bayesian inference

09:45 - 10:30
Modeling resting state networks
Modeling resting state networks and exploring their dynamics using the subjects from the Human Connectome Project database

10:30 - 10:45
Coffee break

10:45 - 11:30
Investigating the effect of strokes using TVB
An example on how to model the structural lesions in a stroke patient
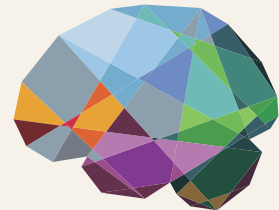
11:30 - 12:15
Hands-on: Modeling epilepsy
Modeling partial seizure propagation for specific patients

12:15 - 13:15
Lunch break

PROGRAM / MAY 16
AFTERNOON SESSION

13:15 - 14:15
Hands-on: Modifying TVB code and implementing new features
A guide on how to add a new neural mass model, integration scheme, or a monitor to the code of TVB

14:15 - 14:25
Closing remarks

14:25 - 14:40
Coffee break

Optional: **14:40 - 17:20**
Hands-on: Bring your own data
Setting up and running the simulations under the supervision of TVB experts

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