PADOVA
neuroscience
CENTER

27 SEPTEMBER 2024 3:00 pm

SALA SEMINARI VIMM

(Via Giuseppe Orus 2, Padova)

PNC SEMINARS

A talk by Peter Zeidman (University College London)

BAYESIAN ANALYSIS OF NEUROIMAGING DATA

In this talk, I will introduce methods for identifying the neural and vascular physiology that gives rise to non-invasive human neuroimaging data (e.g. MRI, fMRI, fNIRS, M/EEG). These methods enable us to go beyond simply describing our data, and test hypotheses about underlying neural and vascular mechanisms that cause the data. The key ingredients are Bayesian statistical methods, which enable us to quantify the evidence for competing explanations for how our data were generated. In particular, using worked examples from clinical and cognitive neuroscience, I will highlight 1) a Bayesian approach for statistical parametric mapping of fMRI data and Voxel Based Morphometry (VBM), and 2) state-space models of neural connectivity and vascular dynamics. All the methods I will describe are freely available in the SPM software package, among others.

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Biography

Peter Zeidman is a cognitive neuroscientist, with a deep interest in how the human brain changes in ageing and dementia. In particular, he develops analysis techniques for investigating brain function, using signals recorded from brain imaging devices (MRI, M/EEG).

He leads the Neurovascular Modelling Group at the Wellcome Centre for Human Neuroimaging at the University College London. His research focus on how the brain and its blood supply change as we age, using mathematical modelling and non-invasive measures of brain function.

Peter Zeidman is also Chair of the Methods Group, which aims at developing statistical methods for analysing neuroimaging data, and make them available via the open source software package SPM. His technical interests focus on Bayesian analysis methods and dynamical systems, particularly Dynamic Causal Modelling (DCM), which is a framework for investigating the function and circuitry of the human brain.