PADOVA neuroscience CENTER

11 JULY 2024 3:00 pm
SALA SEMINARI VIMM
(Via Giuseppe Orus 2, Padova)

PNC SEMINARS

A talk by Andrea Zangrossi (University of Padua)

OCULOMOTOR BEHAVIOR AND THE BRAIN: CLINICAL AND FORENSIC IMPLICATIONS

A rule of thumb in computer science is that if you give a computer the same input, you will always get the same output. However, this does not hold true for humans: providing the same sensory input can lead to a wide range of different behavioral and brain responses. How is that possible? One explanation is that brain activity and behavior are only partially grounded in the properties of the sensory input, and that behavior is strongly influenced by the brain's intrinsic dynamics. These endogenous dynamics are thought to represent stable features of the individual as well as ongoing mental states. A logical consequence is that behavioral dynamics should convey information about the underlying individual brain/mental states.

In this seminar, I will focus on a specific domain of behavior, namely oculomotor behavior – how we scan the surrounding environment through our eye movements. Specifically, I will explore how oculomotor behavior can provide insights into both stable interindividual differences, neurodegenerative processes, and covert cognitive processing.

Indeed, previous studies have shown that eye movements can reveal individual traits and brain properties that are stable over time. Moreover, studying oculomotor behavior has important clinical applications, as it can represent a non-invasive approach for identifying novel biomarkers of dementia. Finally, the nature of eye-movement dynamics makes them suitable for studying ongoing cognitive processing and revealing covert mental states, with potential applications in forensic neuroscience.

Biography

Andrea Zangrossi is an Assistant Professor (RTD-A) at the Department of General Psychology (DPG) of the University of Padova. He obtained a Master's Degree in Neuroscience and Neuropsychological Rehabilitation in 2011, and a PhD in Psychological Sciences in 2017 at the University of Padova (Supervisor: Prof. Giuseppe Sartori). During his PhD, he was a visiting researcher at the Bernstein Center for Computational Neuroscience (BCCN), Humboldt University (Berlin, Germany) where he collaborated with Prof. John-Dylan Haynes.

Between 2017 and 2023, he held positions as postoctoral fellow at the Department of Neuroscience (DNS), and at the Padova Neuroscience Center (PNC) of the University of Padova, under the supervision of Prof. Maurizio Corbetta. In 2018 he won a grant from the BIAL Foundation with a project entitled "When style matters: do oculomotor fingerprint and brain dynamics explain visual exploration and memory strategies?".

His research activity is mainly focused on the following topics: behavioral prediction, the relation between oculomotor behavior and brain functioning, behavioral and psychophisiological techniques to reveal individual information (e.g., autobiographical memories). He also actively seeks to translate these approaches into clinical and forensic neuroscience applications.

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