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Title: Prefrontal cortex and conscious visual perception

Abstract:

Understanding the cortical organization of conscious experience constitutes a central challenge in neuroscience, fueling debate over whether consciousness relies primarily on posterior cortical regions or on anterior structures such as the prefrontal cortex (PFC). In this talk I will present findings from electrophysiological recordings in the macaque monkey PFC showing that prefrontal populations represent consciously perceived visual content even in the absence of behavioral reports. Specifically, using no-report paradigms in which post-perceptual and motor processes are minimized, these representations persist. Beyond conscious content, the PFC also represents the abstract structure of visual sequences and prediction errors, supporting a broader role in consciousness. Finally, I will present recent data suggesting that the dynamics of visual representations in the PFC are characterized by two waves, the first capturing the low spatial frequency structure of images and the second representing categorical and high dimensional visual structure. Overall, these findings challenge theories of consciousness in which the prefrontal cortex has only a post perceptual contribution to conscious experience.

Biosketch:

Fanis Panagiotaropoulos holds a Master's degree (2002) and a PhD in Cognitive Science (2006) from the National and Kapodistrian University of Athens (NKUA), as well as a Bachelor's degree in Psychology (1999) from Panteion University. He worked as a researcher in the French National Institute of Health and Medical Research (INSERM), the Centre for Systems Neuroscience at the University of Leicester, and King's College London in the United Kingdom, as well as the Max Planck Institute for Biological Cybernetics in Germany. In 2024, he joined NKUA as an Assistant Professor of Cognitive Neuroscience and concurrently assumed the role of Affiliated Investigator at the Biomedical Research Foundation of the Academy of Athens. His research focuses on understanding the neural mechanisms that support cognitive processes, with a particular emphasis on conscious perception and the predictive processing of sensory information. His work utilizes advanced neuronal recording technologies, such as Utah and Neuropixels electrode arrays.