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Talk Title:

Autonomic correlate of human motor learning and contextual inference

Abstract:

Autonomic measures, such as heart rate, electrodermal activities, and pupil diameter, have been known to reflect a wide variety of individuals' internal states. Recent studies also highlight autonomic arousal as indices of subjective uncertainty and surprise, which play a significant role in the formation of episodic memory (Clewett et al., Nat Comm, 2020). However, it remains largely unexplored whether/how such autonomic arousal contributes to the formation and expression of motor memory.

Here I present the results from a series of experiments in which we simultaneously measured pupil diameter alone, or pupil diameter, electrodermal activity, and heart rate during motor learning experiments in humans. Based on the results and some simulations using a recently proposed model for contextual inference (Healds et al., Nature, 2021), I will further discuss the potential link between autonomic responses and the contextual inference process.

Biographical Information:

Dr. Atsushi Yokoi is the Researcher at the Centre for Information and Neural Networks, National Institute of Information and Communications Technology, Japan. His research interest includes movement representation and computational mechanisms in human motor control and learning. He graduated from Kyoto University in Global Engineering for his undergraduate degree and an MSc in Energy Sciences. He then completed his Ph.D. with Dr. Daichi Nozaki at the University of Tokyo in the Graduate School of Education, followed by postdoctoral training at the University College London, Institute of Cognitive Neuroscience, and the University of Western Ontario, the Brain and Mind Institute, with Dr. Jörn Diedrichsen. He has been in the current position since 2017. He is also in the Visiting Researcher position at the Osaka University, Graduate School of Frontier Biosciences since 2017.