Department of Economics – Neuroeconomics Seminar

November 24, 2022 - 17:00 - 18:00

Stefano Palminteri
École normale supérieure

The functional form of value normalization in human reinforcement learning

Reinforcement learning research in humans and other species indicates that rewards are represented in a context-dependent manner. More specifically, reward representations seem to be normalized as a function of the value of the alternative options. The dominant view postulates that value context-dependence is achieved via a divisive normalization rule, inspired by perceptual decision-making research. However, behavioral and neural evidence points to another plausible mechanism: range normalization. Critically, previous experimental designs were ill-suited to disentangle the divisive and the range normalization accounts, which generate similar behavioral predictions in many circumstances. To address this question, we designed a new learning task where we manipulated, across learning contexts, the number of options and the value ranges. Behavioral and computational analyses falsify the divisive normalization account and rather provide support for the range normalization rule. Together, these results shed new light on the computational mechanisms underlying context-dependence in learning and decision-making.