Graduate School Event

Thesis Defense: The role of prefrontal spatial coding in supporting a contextual association task

Andrea Cumpelik

Host: Jozsef Csicsvari

Making decisions requires flexibly adapting to changing environments. This process depends on accurately interpreting current contingencies and integrating them with past experience. Two brain regions are particularly critical for this process: the medial prefrontal cortex (mPFC) and the hippocampus. Using contextual information from the hippocampus, the mPFC selects relevant cognitive frameworks and suppresses irrelevant ones to guide appropriate actions. Several studies have shown that some mPFC pyramidal neurons become spatially tuned when spatial information is required to guide goal-directed behavior. However, the role of prefrontal spatial representations in learning and decision making is not well understood. This work aims to characterize the role of mPFC spatial tuning in supporting a novel contextual association task. Rats were trained to learn two cue-location associations on a radial arm maze over multiple days, while we simultaneously recorded from dorsal CA1 of the hippocampus and the prelimbic area of the mPFC. Successful task performance required rats to update a previously learned strategy. We describe a subset of spatially tuned hippocampal and prefrontal pyramidal neurons that “flicker” between multiple spatial representations on different trials, suggesting dynamic, context-dependent coding. This flickering may provide a substrate for how the network reorganizes in response to task demands, likely by enabling the flexible evaluation of competing representations.

Tuesday, February 18, 2025 10:00am - 11:00am

Moonstone Building / Ground floor / Seminar Room G (124.EG.030g) and Zoom

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https://ista.ac.at/en/campus/how-to-get-here/ The ISTA Shuttle bus is marked ISTA Shuttle (#142) and has the Institute Logo printed on the side.