IST AUSTRIA
Institute of Science and Technology

Neurotheory Forum

Neural heterogeneity promotes robust learning

Dan Goodman (Imperial College London)

Host: Everton Agnes

The brain has a hugely diverse, heterogeneous structure. By contrast, many functional neural models are homogeneous. We compared the performance of spiking neural networks trained to carry out difficult tasks, with varying degrees of heterogeneity. Introducing heterogeneity in membrane and synapse time constants substantially improved task performance, and made learning more stable and robust across multiple training methods, particularly for tasks with a rich temporal structure. In addition, the distribution of time constants in the trained networks closely matches those observed experimentally. We suggest that the heterogeneity observed in the brain may be more than just the byproduct of noisy processes, but rather may serve an active and important role in allowing animals to learn in changing environments.

Friday, January 22, 2021 04:00pm - 05:00pm

IST Austria Campus Online

This invitation is valid as a ticket for the IST Shuttle from and to Heiligenstadt Station. Please find a schedule of the IST Shuttle on our webpage: https://ist.ac.at/en/campus/how-to-get-here/ The IST Shuttle bus is marked IST Shuttle (#142) and has the Institute Logo printed on the side.