Two-In-One: A Circuit Optimised for Recollection Predicts Recognition Behavior

Submission ID   3000216

Submission Type Poster

Topic   Neuroscience

Status   Submitted

Submitter   Cristina Savin

Affiliation   NYU

SUBMISSION DETAILS

Presentation Type Oral Presentation

Presentation Abstract Summary Curvilinear receiver operating characteristic (ROC) curves are a classic signature of recognition memory in humans and animals. They have been traditionally explained in terms of two competing models that lead to different interpretations of recognition as either unitary or resulting through the combination of two independent processes. Neither model class specify neural mechanisms or account for all salient aspects of the behavioral data. Here we propose an alternative computational account of recognition memory that can reconcile these seemingly incompatible views. In our model, recognition arises due to two interacting subsystems, optimised for efficient recollection. We show that our model yields a hybrid pattern of recognition memory behavior, which combines aspects of both traditional models. Additionally, it provides a functional interpretation of these features rooted in the physiological properties of the neural circuits supporting memory recall.

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Co-author Information

* Presenting Author

First Name	Last Name	Affiliation	E-mail
Cristina *	Savin *	NYU	cs5360@nyu.edu
Mate	Lengyel	Cambridge University & CEU Budapest	m.lengyel@eng.cam.ac.uk

Keywords

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recognition memory

perirhinal cortex
hippocampus
Bayesian decision theory