Poster abstract

Modeling Interactions Between Interference and Decay During the Serial Recall of Temporal Sequences

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We studied a simple computational model of short-term memory for temporal sequences in which both interference and decay limit memory capacity. Our model is a recurrent Hebbian neural architecture that uses oscillatory attractors to represent stored stimuli. Multiple stimuli can be retained using the same neural substrate because the network's state repeatedly switches between them. We collected behavioral data from human subjects performing running memory span tasks and found that the model can match the memory capacity and position-specific recall rates that we observed. Adjusting just one parameter (weight decay rate) produces shifts in the model's recall rates that resemble those seen in our behavioral data. Using temporally asymmetric learning strongly biases stimuli recall to occur in the same order as presented. We conclude that some basic behavioral properties of human short-term memory (limited capacity, recency effect, shifts in position-specific recall) can be captured by a surprisingly simple oscillatory model.

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