



How We Remember: Brain Mechanisms of Episodic Memory (MIT Press)

By Michael E. Hasselmo

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Episodic memory proves essential for daily function, allowing us to remember where we parked the car, what time we walked the dog, or what a friend said earlier. In *How We Remember*, Michael Hasselmo draws on recent developments in neuroscience to present a new model describing the brain mechanisms for encoding and remembering such events as spatiotemporal trajectories. He reviews physiological breakthroughs on the regions implicated in episodic memory, including the discovery of grid cells, the cellular mechanisms of persistent spiking and resonant frequency, and the topographic coding of space and time. These discoveries inspire a theory for understanding the encoding and retrieval of episodic memory not just as discrete snapshots but as a dynamic replay of spatiotemporal trajectories, allowing us to "retrace our steps" to recover a memory.

In the main text of the book, he presents the model in narrative form, accessible to scholars and advanced undergraduates in many fields. In the appendix, he presents the material in a more quantitative style, providing mathematical descriptions appropriate for advanced undergraduates and graduate students in neuroscience or engineering.

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Editorial Review

Review

With its broad scope -- encompassing personal experience, behavioral experiments, and neurobiological mechanisms -- Hasselmo's *How We Remember* draws the reader deep inside the world of episodic memory. Students and researchers alike will want to read this approachable yet richly detailed treatment of the brain mechanisms supporting our ability to recollect prior events and experiences.

(Jay McClelland, Lucie Stern Professor and Director, Center for Mind, Brain, and Computation, Stanford University)

This book is an incredible resource for anyone interested in the neural mechanisms underlying episodic memory -- it spans the spectrum from synaptic plasticity to neural systems to behavior, connecting everything together with concepts from computational models. Hasselmo has a real gift for conveying this complex material in a clear, approachable, uniquely personal style. The result is a cutting edge, authoritative, and comprehensive book that is also very entertaining and enlightening.

(Randall O'Reilly, Professor of Psychology & Neuroscience, Institute of Cognitive Science, Center for Neuroscience, University of Colorado at Boulder)

About the Author

Michael E. Hasselmo is Professor of Psychology and Director of the Computational Neurophysiology Laboratory at Boston University, where he is also a faculty member in the Center for Memory and Brain and the Program in Neuroscience and principal investigator on grants from the National Institute of Mental Health and the Office of Naval Research.

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