

Title: Neural computation in birdsong learning

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Abstract: A first principles approach in studying brain mechanisms emphasizes that each animal is the product of evolution, hence adaptation, and fitness, hence behavior. Birdsong learning embraces this perspective has emerged as a premiere vertebrate model system for studying learning and memory from the perspective of natural behavior. Staring with this theme, I will show how insights from a broad range of disciplines including ethology, psychology, systems and computational neuroscience, network science and engineering are all contributing to understanding brain mechanisms of behavior. In particular I will develop recent examples that use computational approaches to link single cell activity, network activity, and learned behavior. Ultimately our goal is to describe a personalized neuroscience, which we envision as the variation in the activity of neural networks that is related to individual variation in learned behavior.

Short Biography: Daniel Margoliash received his B.Sc. from the California Institute of Technology. He stayed at Caltech for graduate work, receiving an M.Sc. in BioInformation Systems and a Ph.D. in 1984 in Engineering Science and Neurobiology, working with the great neuroethologist Mark Konishi. He did brief postdoctoral studies with Nobuo Suga at Washington University, St. Louis before starting his lab at University of Chicago in 1986. He is professor in the Department of Organismal Biology and Anatomy at University of Chicago, with appointments in the Department of Psychology, the Committees on Neurobiology and Computational Neuroscience, and the Neuroscience Institute.