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**Title:** How the Brain Programs Itself: The Neuroscience of Rapid Behavior

Reconfiguration

**Abstract:** One of the characteristics that set human beings apart from other animals is the unique capacity to communicate and learn complex skills through verbal instructions. Although typically overlooked, this capacity is computationally sophisticated. Instructions are, in essence, mental “programs” that our brain can interpret and translate into behavior. Understanding the neural code in which these programs are written and the process by which they are executed can shed light on the unique characteristics of human intelligence and flexibility.

In this taIk, I will discuss the results of a body of converging neuroimaging and computational studies examining these mechanisms. Specifically, I will present neuroimaging data demonstrating how these mental programs are hierarchically represented across multiple cortical areas, and I will propose a framework for understanding how information from different brain regions is integrated at the neural level. I will also describe computational and neuroimaging results illustrating how these mental programs are eventually executed and transformed into behavior.

Finally, I will discuss the implications of my research for education and for human brain-to-brain interfacing.