# Peeking inside the brain to develop the next generation of AI

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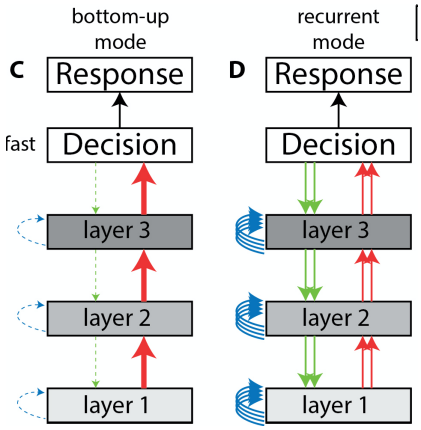


There has been tremendous progress in the development of deep convolutional neural network algorithms to address a wide variety of problems including pattern recognition tasks such as object labeling and games like chess or Go. These neural networks have been inspired by decades old research in Neuroscience elucidating the mechanisms underlying visual processing along the ventral visual stream. Despite these notable advances, human cognition still surpasses the best Artificial Intelligence algorithms to date in most problems in visual cognition. In this talk, I will outline specific examples of how advances in Neuroscience research can push the frontiers in AI. I will focus on problems like pattern completion, context reasoning, and visual attention, that require an interplay between bottom-up inputs and top-down signals that can integrate current inputs with task goals and previous knowledge. By combining behavioral measurements, neurophysiological recordings, and computational models, we can begin to decipher principles of brain computations that can be incorporated into novel biologically-inspired AI approaches.

**Reference:**

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Tang H, Schrimpf M, Lotter W, Moerman C, Paredes A, Ortega Caro J, Hardesty W, Cox D, Kreiman G. (2018) Recurrent computations for visual pattern completion. PNAS, 115:8835-884.

**Biography:**

Gabriel Kreiman received his MSc in Computational and Neural Systems and his PhD in Biology at Caltech in 2002. In 2007, he joined the Faculty of Harvard Medical School, where he is now Full Professor. He is also Associate Director of the Center for Brains, Minds, and Machines. His primary research interests are the computational mechanisms of visual perception and learning.
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