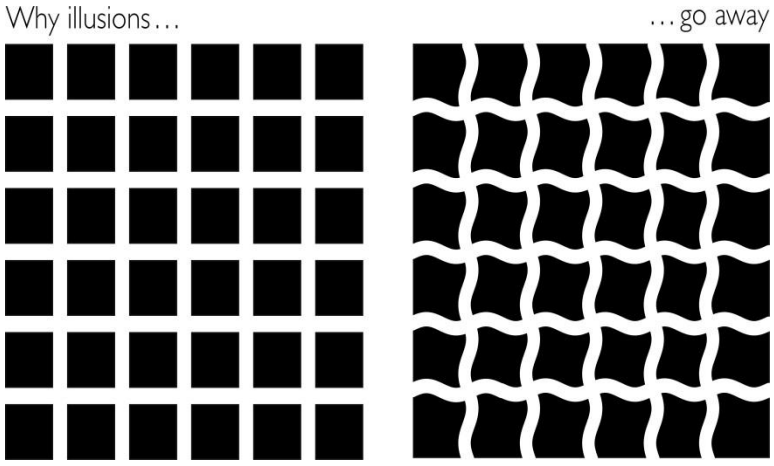
OIST SEMINAR

Date: September 9th, 2015 (Wed)
Time: 11:00 am – 12:00 pm
Venue: Seminar room C700 (Lab3. Level C)
Speaker: Prof. Troy Shinbrot
(Rutgers University, & Editor, Physical Review Applied)

Hardwiring: optical illusions and simulated neuronal architecture



Abstract

Optical illusions provide deep clues into neuronal functioning. For example, it has been found that schizophrenic and autistic subjects perceive optical illusions differently from normal controls. Why this is, or what precisely it tells us about the nature of normal versus abnormal neuronal form or function is less than clear. Moreover, even what we believe we do understand about what optical illusions reveal has been challenged in recent years. For example, a simple grid of lines produces the so-called "Hermann grid illusion" (HGI), which was believed to be related to lateral inhibition between retinal neurons - until several years ago when it was found that the illusion vanishes if the grid is very slightly distorted. In this work, we seek insight into what some optical illusions may be telling us by simulating a particular neuronal architecture that reproduces optical illusions such as the HGI. We show that the illusions can result solely as a result of the architecture and not of a completely plastic, e.g. Hebbian, learning mechanism. We propose that this may serve as a prototype for future studies into ways of, quite literally, hardwiring responses of neural networks.

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