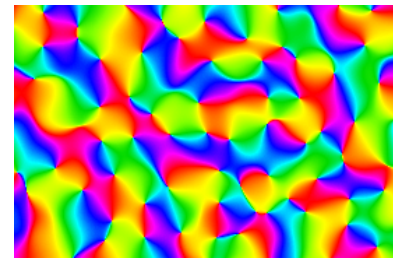


NORTHWESTERN INSTITUTE ON COMPLEX SYSTEMS PRESENTS

Wednesdays

@NICO

Orientation Maps in the Visual Cortex: A Story with a Twist



Michael Schnabel

Max Planck Institute for Dynamics and Self-Organization & Bernstein Center for Computational Neuroscience

**Wednesday, October 21, 2009, 12:00 - 1:00 PM
(Refreshments served at 11:45)**

Neurons in the visual cortex respond best to oriented visual stimuli at a particular position in the visual field. Their selectivities for position and orientation vary systematically along the cortical surface and are organized in maps. Whereas visuotopic maps are continuous, orientation maps form intricate, irregular patterns with numerous characteristic pinwheel defects. Experimental and theoretical evidence suggests that their development is a dynamical process guided by neural activity and sensitive to visual experience. I present a phenomenological model which exhibits realistic solutions consisting of quasiperiodic patterns. The model predicts that long-range interactions are necessary in order to stabilize these states. Our recent analysis of a large tree shrew dataset reveals a systematic coupling of the orientation to the visuotopic map which necessitates to modify the basic symmetry assumptions of our model - with interesting consequences.

*Coauthored with: Matthias Kaschube (Princeton Univ.), Leonard E. White (Duke Univ.), Fred Wolf (MPIDS & BCCN Göttingen, Germany)

NICO Coffee Hour will follow for questions, networking, and collaboration.

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