## Seminar/Talk

# Decoding complex texture motion from populations of direction-selective retinal ganglion cells

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Host: Maximilian Jösch

In many species, direction-selective (DS) retinal ganglion cells strongly respond to motion into a certain (preferred) direction but are suppressed by motion into the opposite (null) direction. A subset of these cells is thought to report the motion direction of global image motion, as induced by body, head and eye movements, to downstream brain areas. The readout of motion direction from DS cell responses has usually been tested with continuously drifting gratings but seldom with naturalistic motion stimuli where direction and velocity change constantly. We performed multi-electrode array recordings on the in-vitro salamander retina where we could record the signals from up to 25 DS cells simultaneously and projected moving textures following a complex trajectory onto the retina. We observed that DS cells also responded in a direction-selective fashion to complex texture motion and that their preferred directions were preserved. Nevertheless, the readout of motion signals from individual DS cells is ambiguous due to the cells' simultaneous encoding of local contrast changes. These ambiguities can be resolved by a population code of DS cells with different preferred directions, leading to a synergistic trajectory readout, i.e., the population code provided more information about the motion trajectory than would be expected from the sum of individual DS cell contributions. Strong positive response correlations between cells enhanced this synergy. This may serve as an example where population codes synergistically improve the extraction of single features from neurons encoding multiple features simultaneously when stimulated with complex visual scenes.

**Monday, March 6, 2017 01:00pm - 02:00pm**
Meeting room 1st floor / Lab Bldg East (I06.01.406)

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