



Mittwoch, 25.11.2016, um 16:00 Uhr

Ort: Reichenhainer Str. 90;

Zentrales Hörsaal- und Seminargebäude, Raum 2/N013

Prof. Dr. Jochen Braun

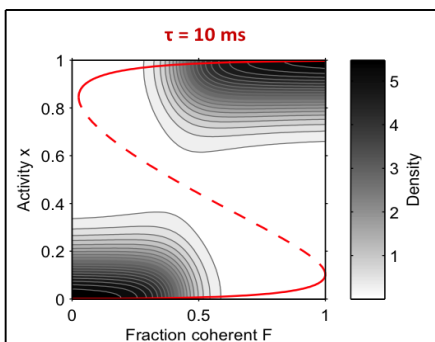
Universität Magdeburg

Fakultät für Naturwissenschaften

Kognitionsbiologie

Dynamics of visual perception and collective neural activity

Visual perception has all the hallmarks of an ongoing, cooperative-competitive process: probabilistic outcome, self-organization, order-disorder transitions, multi-stability, and hysteresis. It is therefore tempting to speculate that the underlying collective neural activity performs an exploratory attractor dynamics (spontaneous transitions between distinct steady-states), perhaps at multiple spatial and temporal scales. Here I summarize our recent investigations of this dynamical hypothesis. In several instances, a careful empirical study of perceptual dynamics *fully constrains* an idealized model of the stochastic dynamics of collective neural activity.



Effective 'energy landscape' and relaxation time of perceptual grouping, inferred from psycho-physical observations. Observers viewed rotational RDK motion with time-varying levels of stimulus coherence. Analysis reveals distinct attractor states (dark areas), corresponding to perception of either coherent motion or incoherent noise. At intermediate levels of stimulus coherence, both attractor states are available.

I conclude that the dynamical hypothesis outlined above permits a particularly close and direct back-and-forth between perceptual experiment and computational theory and thus has the potential to dramatically accelerate our progress in understanding visual function.

Related publications:

Cao, Braun, Mattia (2014) Stochastic accumulation by cortical columns may explain the scalar property of multistable perception. *Phys. Rev. Let.*, 113: 098103

Pastukhov, Garcia-Rodriguez, Haenicke, Guillamon, Deco, Braun (2013) Multi-stable perception balances stability and sensitivity. *Front. Comput. Neurosci.*, 7: 17.

Pastukhov, Vonau, Braun (2011) Believable change: bistable reversals are governed by physical plausibility. *Journal of Vision*, 12 (1): pii 17.

Alle Zuhörer sind ab 15:45 zum Kaffee vor dem Hörsaal eingeladen.



Informationen zum Vortrag erteilt:

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