Interdisciplinary FIAS Colloquium

Thursday, April 15, 2010, 14:30
FIAS, Ruth-Moufang-Str. 1, 60438 Frankfurt am Main, Lecture Hall 0.100

Speaker:  Dr. Michael Spratling, Division of Engineering, King’s College, London
Title:  Unifying Predictive Coding and Biased Competition into a Model of Visual Attention and V1 Response Properties

Predictive Coding and Biased Competition are two influential rival theories of brain function. This talk will demonstrate that these two theories can be interpreted as minor variations on the same underlying mathematical model. This is achieved via a simple mathematical rearrangement of predictive coding, and a straightforward reinterpretation of how it is implemented in cortical circuitry. A nonlinear extension to this model is shown to successfully simulate a large range of neurophysiological data including the receptive field properties of cells in primary visual cortex (V1) and the effects of attention on single-cell activity. Hence, this unified model provides a single computational explanation for a diverse range of neurophysiological findings.