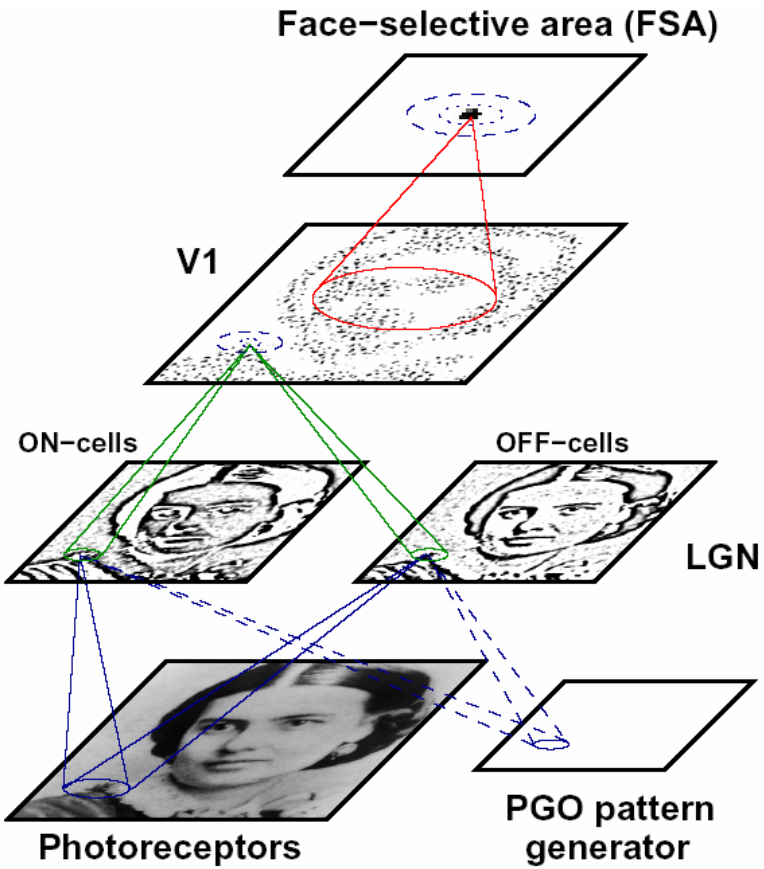
Pozvánka na přednášku

pořádanou v rámci Semináře z umělých bytostí

pátek 19.10.2007
od 17:00
v posluchárně S4

Dr. James A. Bednar

Institute for Adaptive and Neural Computation
University of Edinburgh
http://homepages.inf.ed.ac.uk/jbednar/



COMPUTATIONAL MAPS IN THE VISUAL CORTEX

How can a system as complex as the human visual system be constructed? How can it be specified genetically, while allowing it to adapt to the environment? These questions have been open for quite some time, and much experimental work remains to be done to answer them conclusively. However, computational models have recently become powerful enough to suggest a specific, computational answer: The cortical structures are constructed through input-driven self-organization, driven both by external visual inputs and by genetically determined internal inputs. In this talk, I will describe a unified computational map model, LISSOM, built on these principles. Simulated experiments with LISSOM and related models demonstrate how a wide variety of phenomena follow from them, including columnar map organization and patchy connectivity, recovery from retinal and cortical injury, and psychophysical phenomena such as tilt, motion, and color aftereffects. The model is used to gain a precise computational understanding of existing data, and to make specific predictions for future experimental and theoretical research.

Short biography

Jim Bednar leads the Computational Systems Neuroscience research group at the University of Edinburgh, and is the deputy director of the Edinburgh Doctoral Training Centre in Neuroinformatics and Computational Neuroscience. His Ph.D. in Computer Science is from the University of Texas at Austin, and he also has degrees in Philosophy and Electrical Engineering. His research focuses on computational modelling of the development and function of mammalian visual systems. He is a co-author of the monograph **Computational Maps in the Visual Cortex** (Springer, 2005), and is the lead author of the **Topographica** cortical modelling software package (http://topographica.org). He is also a member of the Board of Directors for the annual international Computational Neuroscience Meeting, and a Member of the Editorial Board for the journal Neural Information Processing.

Akce je podpořena grantem GA UK 351/2006/A-INF/MFF a projektem „IT pro výuku společenských věd“, který je financován z Evropských strukturálních fondů, ministerstvem práce a sociálních věcí a magistrátem hl. m. Prahy.