ELSC Seminar: Jochen Triesch

March 13, 2014

On the topic of: "Efficient Coding in Active Perception"

ELSC cordially invite you
to the lecture given by:

Jochen Triesch
Frankfurt Institute for Advanced Studies

On the topic of:

"Efficient Coding in Active Perception"

The lecture will be held on Thursday, March 13, 2014
at 17:00, at ELSC: Silverman Bldg., 3rd Wing, 6th Floor, Edmond J. Safra Campus

Light refreshments at 16:45

Abstract:

The goal of perceptual systems is to provide useful knowledge about the environment and to encode this information efficiently. As such, perception is an active process that often involves the movement of sense organs such as the eyes. This active nature of perception has typically been neglected in popular theories describing how nervous systems learn sensory representations. Here we present an approach for intrinsically motivated learning during active perception that treats the learning of sensory representations and the learning of movements of the sense organs in an integrated manner. In this approach, a generative model learns to encode the sensory data while a reinforcement learner directs the sense organs so as to make the generative model work as efficiently as possible. To this end, the reinforcement learner receives an intrinsic reward signal that measures the encoding quality currently obtained by the generative model. In the context of binocular vision, the approach is shown to lead to a self-calibrating stereo vision system that learns a representation for binocular disparity while at the same time learning proper vergence eye movements to fixate objects. The approach is quite general and can be applied to other types of eye movements such as smooth pursuit and may be extended to different sensory modalities. Somewhat surprisingly, the approach also offers a new perspective on the development of imitation abilities.
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