



NEURO GLOBAL Seminar

Title

Neurodynamical models for visual action and interaction recognition and its interaction with action execution

Speaker

Prof. Martin Giese

Section Computational Sensomotorics and Section Systems Neurophysiology CIN & HH, Department of Cognitive Neurology, University Clinic Tübingen

Date

March 7 (Thu.)

16:30-18:00 (including Q&A time)

Venue

Lecture room 104, Life Sciences Project Research Building[D04] 1F ,
Graduate School of Life Sciences(Katahira Campus)

生命科学研究所プロジェクト総合研究棟[D04] 講義室104 (片平キャンパス)



Action perception and execution are intrinsically linked in the human brain. Consequently, visual action processing involves a spectrum of cortical functions, ranging from the visual processing of shape and motion, spatio-temporal relationships and semantic aspects of actions, to the interaction of visual representations with motor programs. The talk presents a neural theory that has been developed in close connection to neural and behavioral data. It provides a unifying account for a variety of experimental observation on visual action recognition and its interaction with motor execution. The core of the model is a physiologically-inspired neural hierarchy (‘deep architecture’) that mimics properties of neurons in the visual pathway and associated motor areas. The framework embeds neural field models for the representation of temporal sequences, response selection, and the implementation of flexible couplings between different representations. For the processing of goal-directed actions, the basic hierarchical model has to be extended by special mechanisms for the processing of spatial relationships between effectors and objects. In order to account for the interaction between action perception and motor execution the theory includes also a neural representation for motor programs, which dynamically interacts with visual representations. It is shown that such models account in a unifying manner for experimental results obtained with a variety of different methods, including single-cell physiology, behavioral studies and fMRI experiments, and predicts results at the single cell level about the visual perception of causality. Finally, it is demonstrated how such models can be extended in order to account for the recognition of intention and social interactions from abstract stimuli as investigated in the classical experiments by Heider and Simmel (1944), demonstrating that such stimuli might be analyzed using relatively simple neural mechanisms.

◆Neuro Globalプログラム生(Neuro Global Program Students)

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【Brain Science Seminar Series Ex】/【Advanced brain science seminar series Ex】 1 point

◆生命科学研究所(Graduate School of Life Sciences) : 【単位認定セミナー (A Credit-granted seminar)】 2ポイント(2 points)