

“Gießener Abendgespräche Kognition und Gehirn“

Mittwochs, 18.00 bis 20.00 Uhr, Raum F009

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„From the sensory-motor domain to the perceptual grounding of language: A neural dynamic process account“

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In this talk, I will start with simple sensory motor skills and discuss the properties that neural processes must have to reconcile stability, the resistance of motor behavior to change, with flexibility, the very capacity to bring about change of behavior. In neural process models, these properties emerge from attractors of the neural dynamics that describe recurrent neural networks and their dynamic instabilities. Next, I will show how simple forms of cognition like detection and selection decisions or working memory reflect these same properties and can be addressed in similar terms. The theoretical framework of Dynamical Field Theory is an attempt to formalize the act neural processes at the level of populations and to link them to the sensory and motor surfaces. The main question is then: Does this view of neural processing, the derives from the sensory motor domain, reach higher cognition? Or are new concepts needed that are unique to higher cognition. I will go through neural process accounts of the perceptual grounding of spatial language and the parsing of action sequences to argue that higher cognition is not beyond reach of this form of this style of theory. Throughout the talk, I will refer to experiments closely aligned with the neural modeling as well as to robotic demonstrations of the underlying principles.