



# EINLADUNG

zum Vortrag im Rahmen des Seminars des SFB/TRR 31

**Freitag, 19. April 2013, 14 Uhr c.t.**

im Raum H28 / R 2.31 des Med. Campus Magdeburg  
und Raum W2 1-143 der Universität Oldenburg,  
(per Videoübertragung)

***“Cognitive uncertainty and information integration – A new  
theoretical framework to understand bias and interindividual  
differences in audiovisual simultaneity perception”***

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The auditory and visual signals of a compound external audiovisual event are always produced in synchrony. How is our brain able to “maintain” the physical synchrony of such an external event despite the fact that the sound reaches the receptors always after the light? In the last decade it was proposed that the brain is capable of actively compensating for the different propagation speed of sound and light. However, experimental evidence for such an active compensation mechanism is inconclusive. Given that our brain is, in opposite to a typical lab-situation, continuously bombarded with different audiovisual signals at a time it follows that the brain needs also to “decide” which auditory and visual neural activation belongs to the external event in question. Therefore, I will argue that an active compensation mechanism is insufficient and that, above all, the brain deals with an inverse problem when having to link neural signals in the presence of plenty of other competing ones. This inverse problem creates, for the brain, uncertainty and a higher degree of freedom which of the neural signals belong together. In such a situation, and when “forced” for an action or conscious percept, the brain has basically two alternatives: First, its output (cf. responses) is random across trials. Second, it integrates more information to overcome uncertainty (cf. by integrating past experience/prior information). I will demonstrate that the influence of a prior is proportionally related to cognitive demand and to the individual cognitive ability. This, in turn, can predict the interindividual differences widely observed in tasks measuring audiovisual simultaneity perception. The impact of this framework for perception in general will be briefly discussed.