EBERHARD KARLS
UNIVERSITÄT
TÜBINGEN

**Mathematisch-
Naturwissenschaftliche
Fakultät**
Fachbereich Psychologie
Fachbereich Informatik
Kognitionswissenschaft

Cognitive Science Colloquium

Winter semester 2023/24
Tuesday 12.15 – 13.15h; HS 09 Neue Aula

When	What
19.12.2023	**TALKS BY COGNITIVE SCIENCE PHD STUDENTS (Tübingen)** **1. How to save cognitive resources by using context and habits** Speaker: Maximilian Mittenbühler (Cognitive Modeling) **2. Grasping follows Weber`s law** Speaker: Kriti Bhatia (Experimental Cognitive Science)
	1. Abstract: Maximilian Mittenbühler: How to save cognitive resources by using context and habits Work-group: Cognitive Modeling (M. Butz) A prevailing theory in cognitive science posits that humans employ both a cognitively inexpensive yet inflexible automatic process and a costly yet flexible goal-directed process to choose actions. This is evident in conflict tasks, such as the Stroop and Simon tasks. In these tasks, people respond more slowly and less accurately if a task-irrelevant (supposedly automatically processed) stimulus dimension is incongruent with the task-relevant dimension. Moreover, these tasks reveal that people seem to deploy a form of meta-control, where they rely more or less on automatic or goal-directed processes based on (1) recent experience and (2) contextual or stimulus-specific cues. While we lack a unified explanation for how these effects arise, more importantly we lack an explanation for why they do. We present a probabilistic model of conflict tasks that quantifies cognitive effort as a change in belief and offers an optimality criterion, namely the minimization of free energy. The model demonstrates that free energy, and as a consequence cognitive effort, is minimized by relying on automatic processes (in the form of stimulus-response associations or habits) and using a meta-control mechanism (in the form of contexts). As a result, we show that a number of behavioral effects in conflict tasks are a direct and rational consequence of fulfilling this optimality criterion.

Organisation: Bettina Rolke and Volker Franz

Welcome to everybody!