Project 3:

The theory of sensorimotor contingencies (O’Regan & Noë 2001), a prominent variant of embodied (or enacted) theories of cognition discussed in the introduction, predicts that the relation of changes of afferent signals and actions determines the quality of perception. We test this hypothesis by training subjects with a device, the feelSpace belt, supplying a tactile signal around the waist always pointing towards magnetic north (Nagel et al. 2005). This establishes a new relation of afferent signals and the behavior of the subjects with concomitant changes in perception (Nagel et al. 2005; König et al. 2013; Kaspar et al. 2014). Surprisingly, wearing the belt has already been shown to have a strong emotional impact observed in blind as well as in healthy subjects (Kärcher et al. 2012; Kaspar et al. 2014). The emotional state of the subjects in turn has an impact on their behavior, e.g. on the visual exploration of images. This leads to a closed loop and true enactment (Kaspar & König 2012). We complement this by investigating the influence of simple actions like hand washing on visual exploration and moral judgments (Kaspar et al. 2015). Further technical developments of the sensory augmentation device allow exchanging signals between several subjects. For example, the action of a subject directly generates a tactile signal on the skin (as above) or is wirelessly transmitted to a paired subject and only then transduced to a tactile signal. With this setup, embodied theories of emotion and social understanding are investigated. Importantly, in this setup the concept of extended mind leads to an overlap in the real world, raising fundamental philosophical questions as to the identity and scope of a cognitive agent. These studies are a constitutive component of developing a detailed view about the embodiment and/or enactment of cognition and relate to the areas of emotion, perception, agency and social understanding.