

## SFB/TR 8 Spatial Cognition / IQN Video Conference

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### Natural Interaction with and Robust Navigation for Humanoid Robots

Humanoid robots have become a popular research tool in recent years and more and more research groups worldwide develop complex machines with a human-like body plan and human-like senses. The main motivation of this research area is to develop robots that are better adapted to environments designed for humans.

Several prerequisites exist to develop an autonomous robotic system which operates in human-populated environments. First, the robot needs to perceive the environment with its sensors and to detect people. Second, it has to build and maintain a model of relevant aspects of the environment. Third, the robot should be able to interact with humans in a natural way, i.e., using modalities humans are used to, such as speech, gestures, and eyes-gazes.

In this talk, I will tackle all three problems. I will present our research in the area of natural human-robot interaction in the context of a humanoid communication robot we have been developing.

Furthermore, I will introduce techniques to learn environment models given sensor data acquired with a humanoid and methods to localize the robot in these models.

In the last part of my talk, I will then cover navigation problems of humanoid robots in realistic, complex indoor environments, which contain different rooms as well as multiple levels connected by steps or staircases. The capability to robustly navigate in such an environment is a prerequisite for humanoid robots to fulfill higher-level tasks such as delivery or home-care. I will present existing techniques used for humanoids to navigate in indoor environments, discuss their drawbacks, and introduce our ideas to deal with these problems.

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informelle Kaffeerunde: 15.15  
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