TECHNISCHE FAKULTÄT

VORTRAG

Mittwoch, 8. Mai 2019, 14:45 Uhr
Georges-Köhler-Allee Gebäude 101
Seminarraum 101-02-016/018

Dr. Abhinav Valada

Albert-Ludwigs-Universität Freiburg

Embodied Cognitive Robotics: Rethinking the Relationship Between Perception and Action

A long-standing vision of robotics has been the creation of autonomous robots that can learn from the world around them and assist humans in performing a variety of tasks including services in our homes, transportation and rescue in catastrophe-struck environments. However, the majority of robots today are programmed to operate in carefully engineered factory settings or they are confined to only perform specific tasks in precisely modeled environments. This can be primarily attributed to the narrow scope of current methods that restrict their ability to quickly adapt to new tasks or previously unseen environments. In order to achieve the goal of ubiquitous robots, we need to incorporate a tighter coupling between perception and action to accomplish a variety of tasks in our continuously evolving complex world.

In this talk, I will present state-of-the-art deep learning methods for several fundamental problems that are key enablers for robot autonomy and that allow robots to reliably operate in unstructured real-world environments. Specifically, I will discuss three aspects: 1) learning efficient models for scene understanding and localization, 2) learning to self-adapt in adverse conditions by leveraging multimodal data, and 3) learning to exploit information from diverse complementary tasks using multitask learning. I will conclude the talk with a discussion of challenges and opportunities for scaling up robot learning by closing the perception-action loop through self-supervision.

Gastgeber: Prof. Dr. Rolf Backofen, Prodekan