A U S H A N G

FREIE UNIVERSITÄT BERLIN

Fachbereich Mathematik und Informatik

Promotionsbüro, Arnimallee 14, 14195 Berlin

D I S P U T A T I O N

Donnerstag, 2. Dezember 2021, 9:00 Uhr

[WebEx](#)

Disputation über die Doktorarbeit von

Herrn Andreas Philipp

Thema der Dissertation:
Perception and Prediction of Urban Traffic Scenarios for Autonomous Driving

Thema der Disputation:
Partial Observable Markov Decision Process (POMDP)

Die Arbeit wurde unter der Betreuung von **Prof. Dr. D. Göhring** durchgeführt.

Abstract: Markov Decision Processes provide a framework for solving sequential decision problems under uncertainty. The uncertainty concerns the outcomes of the selected actions and in case of partial observability, also the current state of the agent. The Markov assumption states that the optimal decision depends only on the current state of the world and is independent of the previous history. There are various methods of finding an optimal policy, depending on the nature of uncertainty, the environment and the action space of an agent.

This presentation explains the Markov assumption and gives an overview of various Markov models based on this assumption. It presents the basic Markov Decision Process (MDP) using the 4x3 environment example of Russel & Norvig. The main topic is the Partial Observable Markov Decision Process (POMDP), which generalizes the MDP. A proven solution method is presented using the finite state environment example of Thrun, Burgard and Fox. Thereafter, a real-time capable online solution method, presented in a recent research paper, is discussed. Finally, the major benefits and problems of the approaches are summarized.

Die Disputation besteht aus dem o. g. Vortrag, danach der Vorstellung der Dissertation einschließlich jeweils anschließenden Aussprachen.

Interessierte werden hiermit herzlich eingeladen

Der Vorsitzende der Promotionskommission
Prof. Dr. D. Göhring