

A U S H A N G

FREIE UNIVERSITÄT BERLIN

Fachbereich Mathematik und Informatik

Promotionsbüro, Arnimallee 14, 14195 Berlin

DISPUTATION

Freitag, 1. März 2024, 10:00 Uhr

Ort: Seminarraum 031

(Fachbereich Mathematik und Informatik, Arnimallee 7, 14195 Berlin)

Disputation über die Doktorarbeit von

Maximilian Gruber

Thema der Dissertation:

Consensus-based Online Co-Calibration for Networks of Homogeneous Sensors in IIoT Environments under Consideration of Semantic Knowledge

Thema der Disputation:

Maintaining Trustworthy Measurements in Large Scale Sensor Networks

Die Arbeit wurde unter der Betreuung von **Prof. Dr. A. Paschke** durchgeführt.

Abstract: Sensors provide insights into processes and therefore ensuring reliable sensor measurements is an important task.

Recent developments like the Industrial Internet of Things (IIoT) can lead to the availability of locally redundant sensor information within large scale sensor networks.

Based on this data, new approaches can be researched, that target on-site and automated calibration of available sensors to maintain their performance over time.

The first presentation provides the background and motivation for the field of in-situ calibration and identifies research tasks in it.

Within the field of in-situ calibration a new approach joining semantic information with a mathematical method is developed and evaluated.

It is shown, how relevant information for metrological description of sensors can be represented in a semantic way.

A Bayesian-based approach for the calibration task is developed that allows to incorporate pre-knowledge and operates iteratively on blockwise data. It is then conceptualized, how the mathematical method can be initialized based on a semantic representation of the sensor network. The second presentation summarizes the key results of the guiding research questions.

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. A. Paschke