



TOPICS

The lectures and workshops are primarily aimed at Master and Ph.D. students interested in topics of a **Cyber Physical System** and **Digital Twin Road** of the future.

- On the Physical level:
 Real stress conditions in road pavements *
 Reinforced jointless concrete base layer *
 Development of high performance
 asphalts * Physical numerical modeling of
 the functionalized road under tire load *
 Sensitive road layer for the detection of
 wheel loads
- On the Informational level:
 High resolution geometric-semantic as-is
 modeling from 3D point clouds ◆ Highly
 accurate position data using cooperative
 sensor data fusion ◆ Roadside sensors for
 generation of complex traffic-related load
 data ◆ Linked data
- Sustainability assessment:
 Life cycle sustainability assessment for a digital twin of the road system

ORGANIZERS

ISD, TU Dresden gia, RWTH Aachen University BASt, Bergisch Gladbach



Participation fee (incl. lectures, workshops, lunch, BBQ, dinner event): for free

Accommodation (incl. breakfast): for free

Travel costs: not included / by participants

APPLICATION DEADLINE

31 March 2023. Please send the <u>application</u> form by email to <u>sfb-trr-339@tu-dresden.de</u>.

CONFIRMATION

14 April 2023

CONTACT

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SFB/TRR 339 – Digital Twin Road

Physical-Informational Representation of the System "Road of the Future"

International Summer School

21 Aug – 25 Aug 2023

Bergisch Gladbach (near Cologne) Germany













VENUE

Federal Highway Research Institute (BASt)

Brüderstraße 53 51427 Bergisch Gladbach



ACCOMMODATION

Kardinal Schulte Haus Overather Straße 51-53 51429 Bergisch Gladbach

SCHEDULE

Monday am: arrival & check-in

21. Aug 2023 pm: BASt tour #1

BBQ

Tuesday am: lectures 22. Aug 2023 pm: workshop

Wednesday am: lectures

23. Aug 2023 pm: duraBASt tour



social activity dinner

Thursday am: lectures 24. Aug 2023 pm: workshop

BASt tour #2

Friday am: lectures

25. Aug 2023 workshop result evaluation

closing pm: departure

LECTURES AND SPEAKERS

Virtual Experiments on Pavements

Prof. Dr.-Ing. habil. Michael Kaliske TU Dresden, Institute for Structural Analysis

Digital Twin as Digital Basis - Usage for Parametric Road Planning

Dr.-Ing. Veit Appelt A+S Consult GmbH

Fiber Optic Sensors

Prof. Dr. techn. Werner Lienhart TU Graz, Institute of Engineering Geodesy and Measurement Systems

Vehicle Dynamics Enhancements Enabled by Digitalization

Dr.-Ing. Paul Zandbergen Ford Motor Company

Load Capacity Measurement and Data for Digital Twin

Dr.-Ing. Dirk Jansen BASt, Highway Construction Technology

Novel Antenna Technologies for Realizing Smart Road Pavement Systems

Dr.-Ing. Abdul Quddious TU Dresden, Institute of Communication Technology

Life Cycle Sustainability Assessment: Advantages and Challenges

Prof. Dr.-Ing. Marzia Traverso RWTH Aachen, Institute of Sustainability in Civil Engineering

Linked Data

Prof. Dr.-Ing. Jakob Beetz RWTH Aachen, Design Computation

Requirements and Architecture for Autonomous Driving

Prof. Dr.-Ing. Lutz Eckstein
RWTH Aachen, Institute for Automotive
Engineering

Virtual and Augmented Reality

Sonja Nieborowski BASt, Maintenance of Engineering Structures

Digital Twin Tunnel

Dr. Ingo Kaundinya, Anne Lehan BASt, Tunnel and Foundation Engineering

WORKSHOPS

1 EXPERIMENTAL

- Experiments on asphalt and concrete specimen in BASt laboratories
- Material models for numerical simulation of structures based on experiment data

Moderation: Dr.-Ing. Marco Liebscher Dr.-Ing. Gustavo Canon Falla

2 SENSORS

- · Point cloud capturing by laser scanning
- Weigh in motion sensor for vehicle positioning and load distribution
- · Vehicle positioning using sensor fusion

Moderation: Prof. Dr.-Ing. Jörg Blankenbach