

Korea-EU Horizon Europe Researchers Networking Forum on Energy & **Advanced Mobility**



Prof. Dr.
*appointed professor of the High-tech
Agenda Bavaria, Germany
Research Professorship*

Galia Weidl

University of Applied
Sciences Aschaffenburg



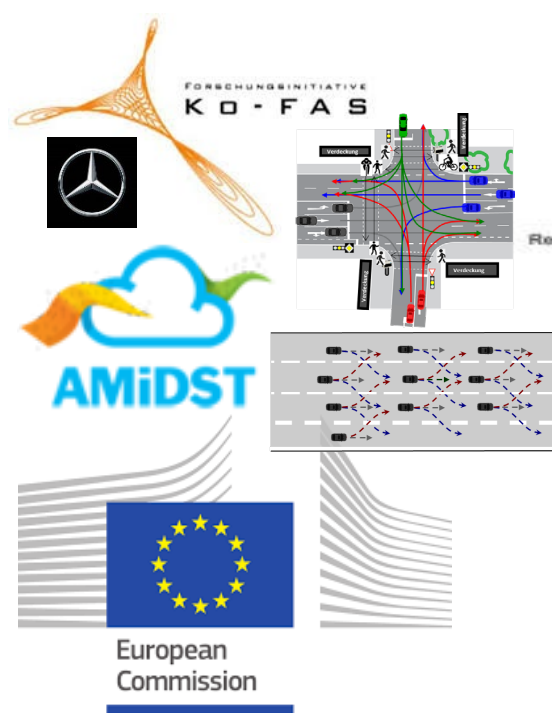
TH Aschaffenburg
university of applied sciences

Competence Center
Artificial Intelligence
Lab: Connected Urban Mobility –
Intelligent Traffic Infrastructure



NOTE: You are certainly allowed to add more slides for sharing but your presentation should not be longer than 3 minutes

Prof. Dr. Galia Weidl – my journey of acquiring knowledge & experience in Europe



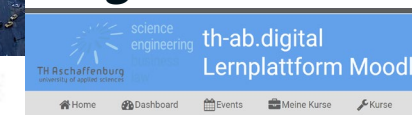
Research Professorship Connected Urban Mobility– Learning Infrastructure



<https://i4driving.eu/>



HASKI – Hochschullehre: Adaptiv, selbstgesteuert, KI-gestützt





• Prof. Dr. Galia Weidl



Galia.Weidl@th-ab.de

+49 176 10 50 6608



Artificial Intelligence and Machine Learning for CCAM Applications



Goal of the research team is to develop methods, based on Artificial Intelligence and Machine Learning, which can be used for Connected Cooperative and Autonomous Mobility (CCAM) Applications. The research is focusing of methods, e.g. Deep Learning for data mining to extract the causality relations in the domain. These are used for hypotheses in Bayesian Networks in combination with knowledge-based vehicle behavior hypotheses, in order to represent the heterogeneity of vehicle behavior for automated mobility.

RESEARCH TOPICS

Intelligent Mobility Concepts (& multi-modal Mobility)

Strategies for avoiding congestions under the conditions of mixed traffic, involving automated/autonomous and traditional vehicles (Autonomous Driving & Smart City)

Monitoring, Root Cause Analysis & Maintenance on Demand for Intelligent Traffic Infrastructure

Interpretable features for probabilistic Graphical Models & Learning, Interpretable Model-Architectures for Early recognition of critical events. Analysis & Network Operation Research on the interactions between the network-elements („green wave“, coordinating several traffic lights for congestion mitigation). Evaluation of network-performance-capability. The Vision on Traffic Optimization by C2X?

Scenario-based Development and Robustness of Objects' Detection during automated driving. Hybrid AI-Modells for Early Detection of Objects and Movement-Intention Prediction

Expert-Guided Representation and Constraints for Learning, Novelty & Anomaly Detection, Clustering of Scenarios and Clustering of Anomaly patterns

Surrounding-aware Maneuver Recognition. Context-Dependent Situation Interpretation on Highways and on Road Intersections

AI-based Prediction of Intentions and Maneuvers of all surrounding road users, Recognition of Vehicle Behavior, Towards a License for autonomous driving: Virtual CCAM-assessment in Reference to skillfull human driving behaviour in typical & critical driving situations. [Need of explanations for trustworthy solutions & acceptance](#)

APPLICATION FIELDS

Connected Cooperative and Autonomous Mobility (CCAM) in Mixed-Traffic)

METHODS

Interpretable and explainable AI, probabilistic Graphical Models, Hierarchical Bayesian Networks, Cognitive Modeling, Knowledge-based Systems, Big Data and Data Mining, Deep Learning, Reinforcement Learning, Mathematical Methods (Analysis, Stochastics), Simulation of Corner Cases, Simulation of heterogeneous weather conditions and object detection at any weather conditions to ensure robustness of detection for autonomous driving, Data Science



1. Short Introduction of my Organization

Real City Living Lab Aschaffenburg

Con-UM: Connected Urban Mobility – Intelligent Traffic Infrastructure



TH Aschaffenburg
university of applied sciences

Type of Institution: **Competence Center Artificial Intelligence**

Infrastructure: **Real City Living Lab Aschaffenburg @ City Ring AB**

Investment (500,000€): **12 LiDAR sensor systems with SW package for detection of all road users, Visibility Sensors (adverse weather conditions) and 2 Environmental Sensors (mobile)**

funded by the High Tech Agenda Bavaria in relation to the research professorship "Connected Urban Mobility - Learning Traffic Infrastructure" of Prof. Dr. Galia Weidl, THAB



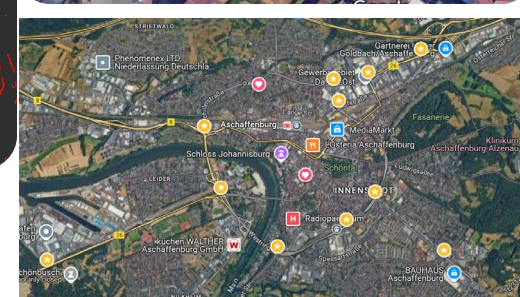
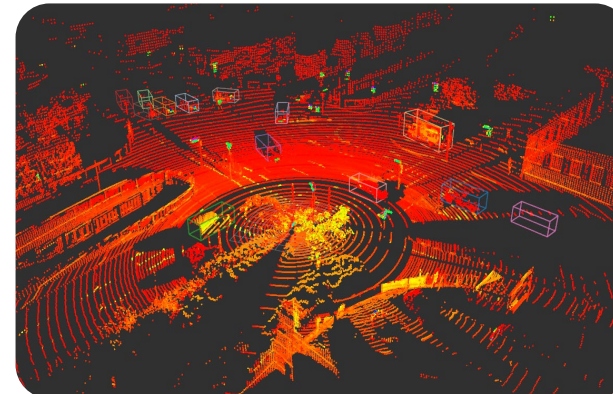
Research team: 2 PhDs @THAB & 1 industrial PhD @ ZF

Ongoing plans for more resources: Digital Twin projects

Institutional area of focus: **Advanced Mobility, Digital Twin**

University Ranking:

THAB consistently ranks among the top institutions in Bavaria and across Germany in terms of **third-party funding per professor** in the research areas of Intelligent Systems, Materials, and Knowledge Transfer & Structural Change, with current public funding of **€11.5 million**.



2. Expertise

Expertise of our University: [Aschaffenburg](#), [Competence Center Artificial Intelligence](#)

Our potential contribution to consortium: **Explainable AI, System perception, Situation analysis, experimental testing**

1. *Smart Infrastructure (available): Real City Living Lab @ City Ring AB.*

Data Fusion:

- 12 LiDAR sensor systems & SW package for detection of all road users
- Visibility Sensors (adverse weather conditions) and
- 2 Environmental Sensors (mobile)

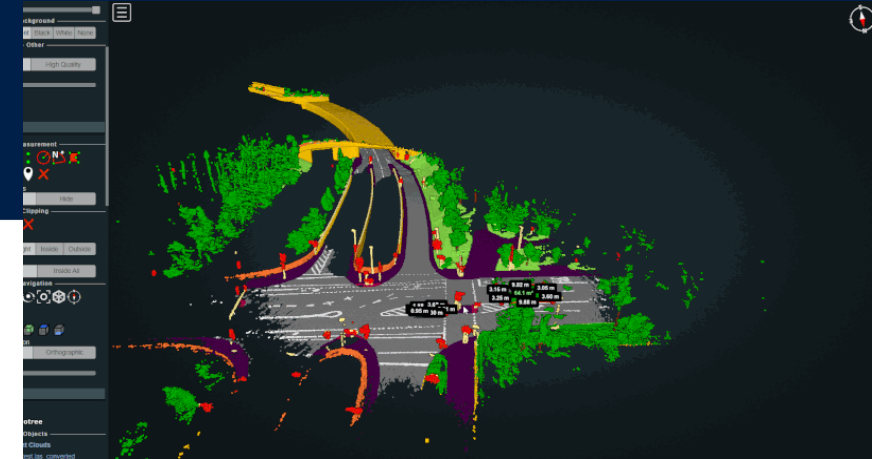
2. *R&D on Digital Twin: Adopt & Develop Open Source Software*

Research focus on

- **Data fusion & Traffic flow analysis:** traffic patterns at different times and correlations to traffic disturbances
- Understand the mechanism behind **accidents and traffic disturbances** and **enrich the AI models with root causes**
- Understand the impact of **traffic flow patterns** and its **environmental impact (air quality)**

➔ **Prevention** of accidents and traffic disturbances

➔ **Increased safety** of all traffic participants





3. Your Project Idea

① HORIZON-CL5-2026-10-D6-01: Flagship-pilot: large-scale demonstrations of CCAM Main Objectives: - Integrate and demonstrate advanced CCAM technologies in real urban environments. - Validate safety, efficiency, and public trust through multi-site testing. - Develop policy and business models for large-scale deployment. Our Idea briefly explained: CCAM in learning traffic infrastructure (Real City Living Lab AB) ▪ Create a city-scale simulation–demonstration framework, connecting infrastructure data with AI-based perception and intentions recognition of traffic participants. ▪ Evaluate how CCAM systems can operate effectively in real urban environments by ensuring: Safety under severe weather conditions, cybersecurity, and reliability. ▪ Strengthen societal trust by co-creation with citizens/stakeholders. Define criteria & set priority.	② HORIZON-CL5-2026-10-D6-02: Geopolitical competition and socioeconomic resilience in CCAM Main Objectives: - CCAM in Learning Infrastructure perspective - Develop innovation and policy roadmaps, ensuring Europe’s leadership and resilience in CCAM under evolving global competition. Our Idea briefly explained: CCAM in learning traffic infrastructure (Real City Living Lab AB) ▪ Simulate and assess CCAM impacts using the digital twin of Aschaffenburg to evaluate socioeconomic, employment, and demographic effects within a real-city living lab. ▪ Integrate economic–transport modeling with urban digital twins to build an evidence-based road map for sustainable and inclusive mobility policies. ▪ Develop resilient governance and business strategies stress-tested against varying geopolitical and economic conditions.
③ HORIZON-CL5-2027-06-D6-04: Holistic solutions for CCAM integration in critical scenarios Main Objectives: - Identify and classify critical edge cases for CCAM operations in Learning Infrastructure. - Develop AI-driven decision support for real-time risk management. - Strengthen cooperation between road authorities (AB), mobility & ITS operators (SWARCO), and emergency services. Our Idea briefly explained: CCAM in learning traffic infrastructure (Real City Living Lab AB) ▪ The project designs a Digital Twin-based service to maintain safe and resilient urban safety. ▪ Design holistic CCAM solutions in for rare, critical, and high-risk scenarios ▪ Ensure: Real-time holistic situation interpretation for road users, operators, and service provider ▪ Develop AI-driven decision support for real-time risk management: mitigate risk scenarios ▪ Explore in the digital twin the CCAM & Learning Infrastructure Integration with Traffic management, mobility platforms, and emergency services.	④ HORIZON-CL5-2026-10-D6-10: Enhanced resilience in multimodal passenger transport through digital technologies and AI Main Objectives: Multimodal passenger transport systems in Learning Infrastructure perspective - Increase resilience of multimodal passenger transport systems using digital twins and AI. - Enable predictive maintenance and real-time disruption management. - Enhance safety for all traffic participants, reliability, and network efficiency. Our Idea briefly explained: CCAM in learning traffic infrastructure (Real City Living Lab AB) ▪ Use real-time data AI analytics systems to dynamically predict & respond to disruptions → Optimizing network recovery. ▪ Predictive maintenance strategies by AI to prevent failures. ▪ Guidelines and tools for operators to minimize disruptions and run emergency simulations. ▪ Real-life demonstrations in multimodal corridors (time-coordination: bike, bus, train, shared mobility) in Aschaffenburg, Germany.



4. Profile You are Seeking and Why

PRESENTED PROJECT IDEA: Extend *Real City Living Lab Aschaffenburg* to
Learning Infrastructure in CCAM perspective

1. Our Expertise & Role & Strengths

THAB expertise in **Explainable AI, System perception, Situation analysis, experimental testing**
interested in joining a suitable consortium to analyse & advance CCAM in the context of Learning Infrastructure.



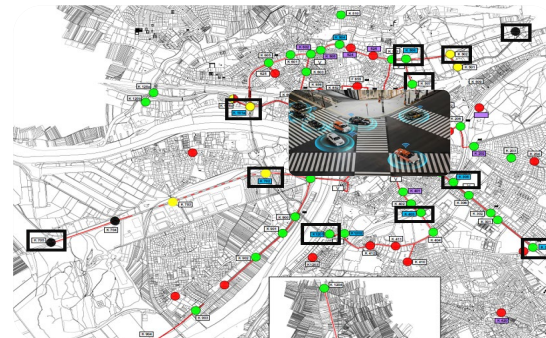
2. Looking for Partners with Experience in

- CCAM R&D to explore perspective gains from Operation in Learning Infrastructure
- Digital Twin Living Lab, to collaborate on the scaling & transfer of Open Source Software for Advanced Mobility in the Real City Living Lab Aschaffenburg and beyond
- Reinforcement Learning for Smart Control of traffic lights (TL) or without any TL, explore Connected Mobility

3. Existing Collaboration: THAB x Seoul University

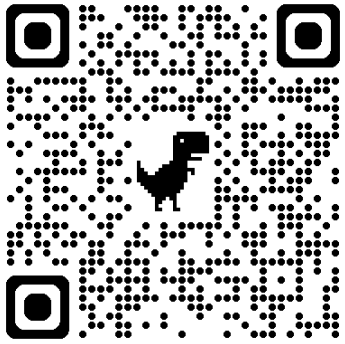
University of Seoul: Research focus on:

- Autonomous mobility systems
- Urban-scale simulations (Digital Twin)
- Multi-agent & ROS-based robotics
- Policy & regulatory impact analysis





5. Contact Details



Google Scholar

Prof. Dr. Galia Weidl

Competence Center Artificial Intelligence

Lab: Connected Urban Mobility – Intelligent Traffic Infrastructure

Mobile: +49 176 1050 6608

E-Mail: Galia.Weidl@th-ab.de

University of Applied Sciences Aschaffenburg

63743 Aschaffenburg



LinkedIn