

**VW - Seminar on automated driving with artificial intelligence and functional safety as part of an EU funding program for doctoral students from the Marie Curie Foundation**

**5.-6. July 2022, Mobile Life Campus, Wolfsburg**



**Moderation: Dr. Thomas Scharnhorst**  
former Director at E/E Volkswagen

**Agenda Day 1**



**08:45 Begrüßung und Einleitung**  
**Dr. Gabriel Schwab, Volkswagen**



**09:00 Keynote: Autonomous Driving – enabling new mobility services**  
**Dr. Helge Neuner, Head of Self-Driving System Development, Volkswagen**

- Use cases
- Technical challenges
- Way to market



**9:45 Low-level sensor data fusion for Autonomous Driving**  
**Dr. Thorsten Bagdonat, VW- Group Innovation, Head of Vehicle Perception**

- Strength and weaknesses of different sensor modalities
- Why low-level fusion instead of high-level fusion?
- A low-level fusion-based perception SW stack developed at VW Group Innovation
- Application within project “L3-pilot” – Demo at HH ITS World Congress

10:30 Break



**11:00 Challenges in behaviour and motion planning on the path towards a scalable driving function.**

**Sascha Rosbach, Senior Software Developer, Cariad SE, Wolfsburg**

- Overview of the behavior and motion planning methodologies
- Challenges on the path towards a scalable framework
- Model-based planning algorithms
- Neural-network to tackle important aspects of the decision-making task



**11:45 AI and data in the development of self-driving vehicles**  
**Dr. Reinhard Stolle, Managing Director, Argo AI GmbH, Munich**

- Street by street, block by block
- Examples of AI in autonomous vehicles
- Rules, learning, data, and the long tail
- Evaluation

12:30 Lunch Break



**13:30 General Strategies for Software Design in Safety-critical ECUs**

**Dipl.-Math. Alexander Much, Director System Architecture, Elektrobit Automotive GmbH, Erlangen**

- Is there safety in software?
- What does not work?
- Some general definitions and patterns
- Basic patterns for software integrity
- Outlook towards big systems



**14:30 “SOTIF - How to demonstrate “absence of unreasonable risk” for automated systems?”**

**Dr. Susanne Ebel, Engineering Governance, Robert Bosch GmbH, Stuttgart**

- Meaning “absence of unreasonable risk” in scope of Functional Safety vs SOTIF
- Definition acceptance criteria for SOTIF
- Different approaches and examples for acceptance criteria
- Argumentation SOTIF release for automated systems

15:00 Break



**15:15 Safeguarding Strategies for Software-defined Products**

**Matthias Maihoefer, Head Functional Safety, Schaeffler Technologies AG & Co. KG Herzogenaurach**

- General software safety challenges and novel questions introduced by AI/ML
- Applicability and suitability of “well-trusted” technical and process-based safeguarding approaches
- Balancing risk reduction and risk management strategies in the wake of technological advances



**16:00 How to design fail-operational, hard real-time systems for highly/fully automated driving.**

**Eric Schmidt, Director Safety, Security & Quality TTTech Auto AG**

- Why a fail-operational system design is needed for highly/fully automated driving
- Why a fail-operational system design is so difficult
- The key elements of a suitable fail-operational architecture for highly/fully automated driving
- Mastering complexity by designing for high determinism



**16:45 Domain Separation for Vehicle Networks**

**Alexander Tschache, Vehicle Security Architect EE, Volkswagen**

- Challenges of integrating online capabilities and safety-critical systems
- Attacker model to consider differences between online and offline attacks
- Effective separation of online and offline domains within the vehicle

17:30 **Summary**

18:00 Get together

## Agenda Day 2



**09:00 Keynote: Paving the way for the “Software -defined vehicle”**  
**Dipl.-Inf. Martin Schleicher, Head of Software Strategy, Continental AG**

- Challenge of combining software lifecycle and automotive quality
- Software thinking: architecture, development methods, business models
- Building blocks for the software-defined vehicle
- Continentals approach



**9:45 Reliable validation of Highly Automated Driving functions by increasing the virtualization level of high computing platforms and smart sensors**  
**Dipl.-Inf. Stefan Wonneberger, Head of Virtual Environment Development, Cariad SE, Wolfsburg**

- Virtualization of High Computing Platforms
- Transfer of Communication- and Middleware Layer in SIL Environment as Key Factor
- End-2-End Communication and Vehicle Network in SIL Environment
- Analysis of Technical State-of-the-Art in Virtualization w.r.t. Standardization Approaches

10:30 Break



**10:50 Verification of automated driving functions by means of virtual test driving**  
**Lisa-Catherine Schudi, Manager Braunschweig Office IPG Automotive GmbH**

- Generation of scenarios
- Sensor simulation
- Integration of automated driving functions



**11:35 Safety assurance for AI-based perception: How can we trust what we see?**  
**Dipl.-Inf. Dipl.-Ing. Karsten Roscher, Head of Dependable Perception & Imaging, Fraunhofer Institute for Cognitive Systems IKS, Munich**

- The perception challenge and the semantic gap
- An effective model for safety assurance of ML-based functions
- A peek into the black box: Understanding insufficiencies
- Operation-time measures: Uncertainties and AI monitoring



**12:20 AD Regulation & Management System to meet legal and technological compliance requirements for SAE L3 & L4 applications**

**Lucas Bublitz, Senior Consultant Autonomous Mobility, P3 automotive GmbH, Stuttgart**

- Requirements for SAE L3 und L4 functions include permanent field monitoring and a continuous SW update capability
- Implementation of the P3 regulatory screening for SAE L3 and L4 regulations and standards
- Illustrations of relevant use cases including UN ECE regulation for automated lane keeping systems (R157)
- Proposal of a holistic & integrated AD management system

**12:55 Closure**