**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**

08:30 **Welcome and Introduction**
**Dr. Gabriel Schwab, Volkswagen**

08:45 **Keynote: Autonomous Driving – enabling new mobility services**
**Dr. Helge Neuner, Head of Self-Driving System Development, Volkswagen**

- Use cases
- Technical challenges
- Way to market

09:30 **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

10:15 Pause

10:45 **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

11:30 **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

12:15 Lunch Break

13:15 **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

14:00 **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

14:45 Pause

15:15 **"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

16:00 **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

16:45 **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

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

09:45 **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 Enviroment as Key Factor
- End-2-End Communication and Vehicle Network in SIL Enviroment
- Analysis of Technical State-of-the-Art in Virtualization w.r.t. Standardization Approaches

10:30 Pause

10:50 **Verification of automated driving functions by means of virtual test driving. Martin Hermann, Business Development Manager, 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**

**Registration mandatory (for 5th and/or 6th of July) via Email (nandan.dutta.chaudhury@volkswagen.de). Limited number of seats available.**