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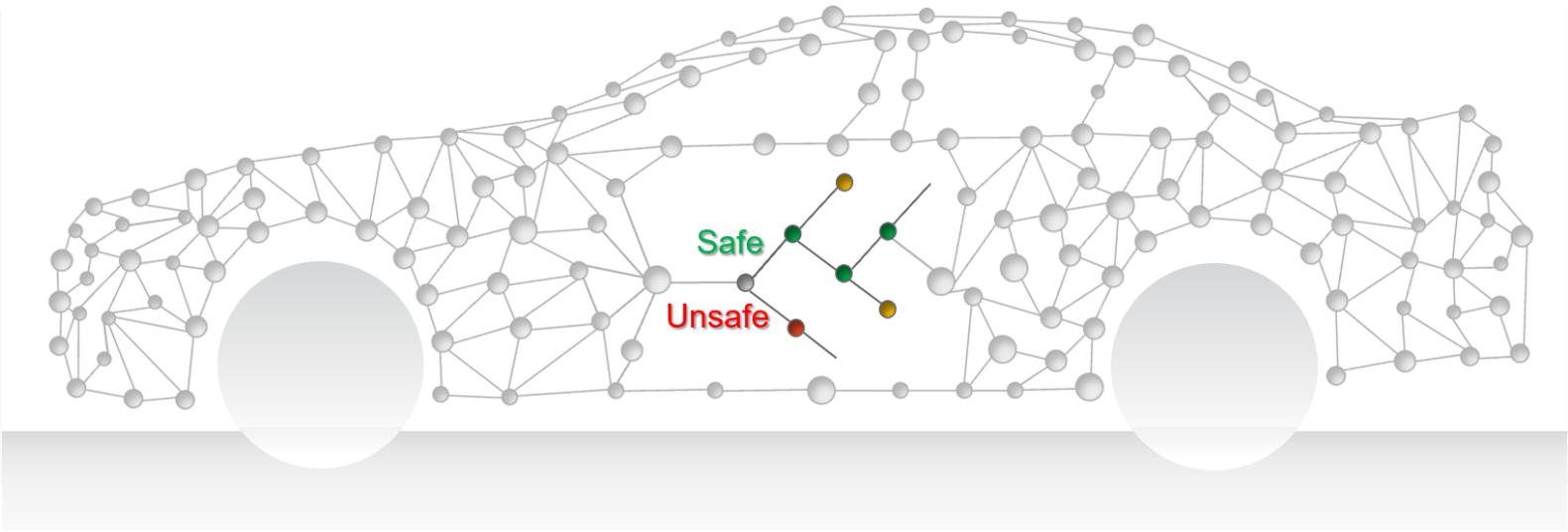
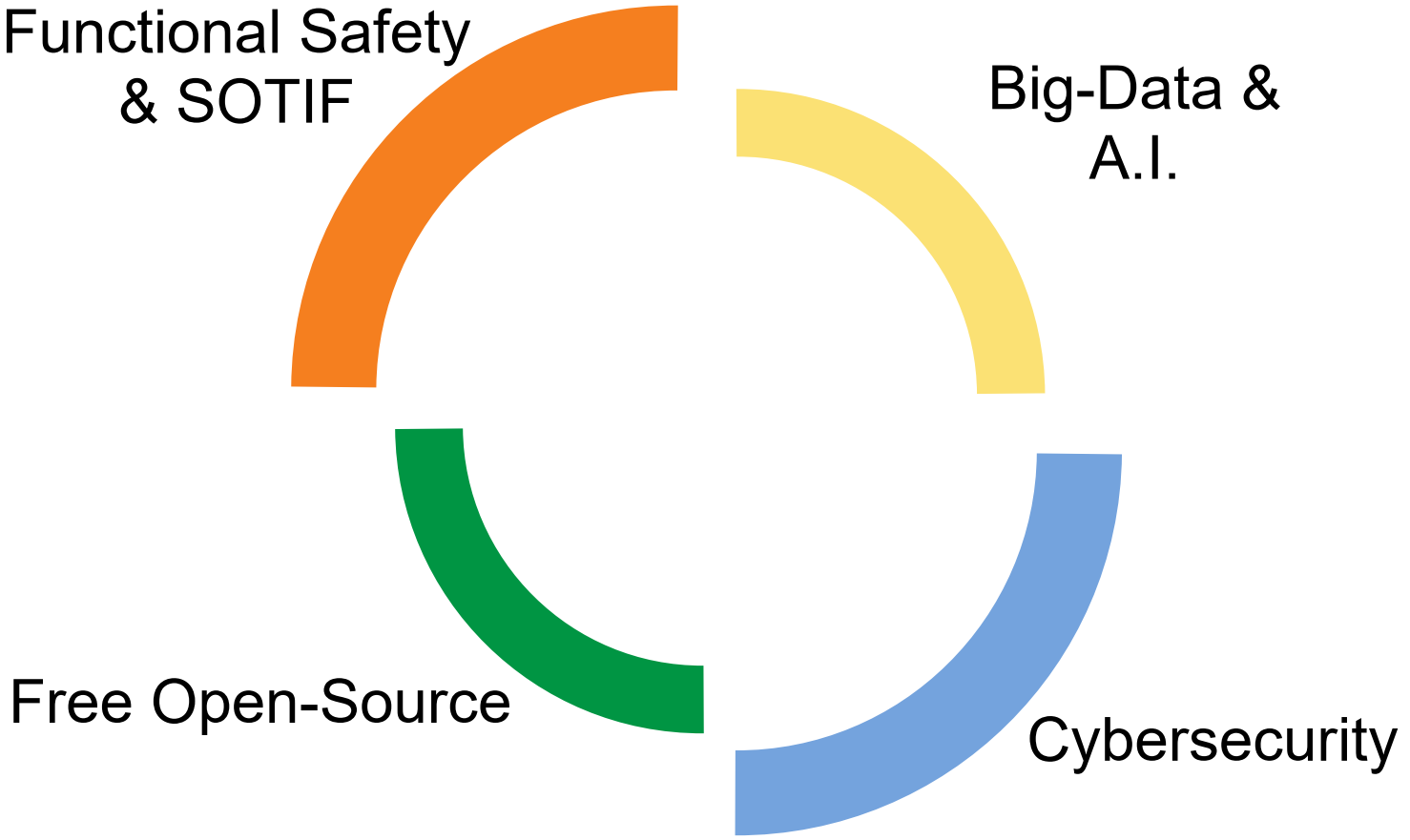
Automotive Symposium 2024



Arabella Alpenhotel
Seeweg 7
83727 Spitzingsee

exida.com GmbH
Prof.-Messerschmitt-Str. 1
85579 Neubiberg

Topics this year



Come and join us to discuss the latest and innovative topics in the automotive industry. Let us discuss the newest developments for safe autonomous driving using artificial intelligence, the amazing possibilities of Free Open-Source Software or the frightening insights of the importance of Cybersecurity concepts and controls. Experience all this in an unforgettable setting with many experts.

Kerstin Tietel
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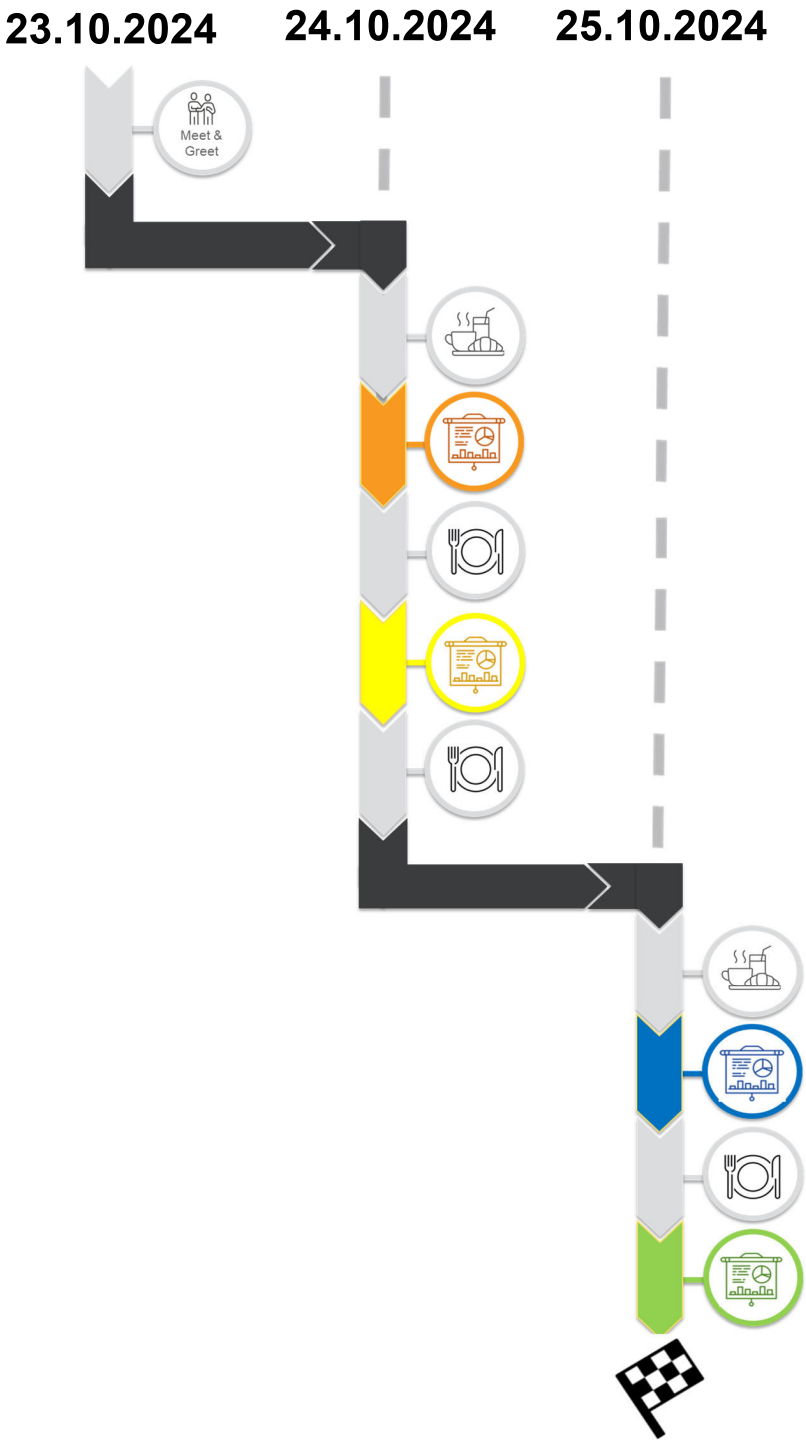
Symposium Schedule



You can expect two unforgettable days full of information, knowledge exchange, and impressions at an altitude of 1100m (3600ft) in an outstanding Alpine landscape.

Statistical Validation of BMW Personal Pilot L3

Statistical safety validation of automated driving systems requires empirical models of the system and the environment. We present how the model structure can be found and the model parameters are learned from fleet and test track data. In short, for all identified hazard scenarios, we identify the dominant environmental influence factors of the known safety-related uncertainties of the system design based on expert knowledge and experimental design, extract fleet data within the ODD on these influence factors to learn statistical models of their joint distribution of the environment and carry out representative experiments to estimate the uncertainties of the system design. These models are then used to calculate the residual risk for each vehicle-level hazard scenario using Statistical Simulation.

Within the large development project of BMW's first L3 driving system, many parties had to collaborate effectively to argue the safety case. To support this, customized tooling has been developed to support all steps of the statistical validation workflow. We show examples of tools and processes for experimental design, parameter sampling, data visualization, model fitting and model-in-the-loop simulation in a scalable framework leveraging established open-source libraries in the Python ecosystem and modern software development practices.

Prof. Dr. Moritz Werling

Dr. Alexander Prehn

Explainable Modeling and Statistical Evaluation and Enhancement of ADS

Deep Neural Networks [DNNs] are being integrated into Automated Driving Systems [ADS] to perform complex perception and control problems. However, DNNs are generally challenging or impossible to interpret for the purpose of functional safety [FuSa] or Safety of the intended functionality [SOTIF] assessment. In contrast, physical models of the driving task are generally much easier to explain and assess than the abstract statistical models encoded in a DNN.
We will present a statistical modelling and evaluation workflow that can be easily explained to FuSa and SOTIF assessors. Our workflow uses Bayesian networks [BN] refining the physical model of an ADS in a given scenario. The Dominant Factors [DF] that impact the ADS risk will be identified based on simulations of the physical model and BN. The workflow then evaluates under which conditions a tolerable risk target [TRT] can be achieved.

Rainer Faller
exida

Frauke Blossey
exida

Systematic identification and analysis of ODD based core interactions for autonomous vehicles safety assurance

Antonello De Galizia

CARIAD
A VOLKSWAGEN GROUP COMPANY

De Galizia deep dives into the intricate domain of SOTIF for the development of autonomous vehicles, with emphasis on the critical role of the ODD and scenario-oriented core interactions analysis. He explores methodologies and strategies aimed at effectively navigating ODD complexities to make informed assumptions and identify potential functional insufficiencies. The aim is to empower stakeholders in enhancing the robustness of SOTIF development processes by elucidating key techniques and best practices to ensure safe automated driving.

Key insights:

- Systematic approaches to explore the ODD complexity for making assumptions
- Safety analysis techniques to identify potential functional insufficiencies

Bridging the Gap between AI Standards and Safe AI Deployment

Molly O´Brien

exida

The talk will be structured around three challenges that the existing standards don't address:

- Challenge #1: Specifying AI performance targets to ensure sufficient safety at the system level.
- Challenge #2: Understanding and modeling AI performance.
- Challenge #3: Evaluating AI performance throughout the Operational Design Domain for safe AI deployment.

Automotive Culture Café: Where Engineering Meets Culture

In the world of cutting-edge automotive engineering, culture is the invisible engine driving innovation, safety, and comprehensive verification. As we strive to meet the rigorous standards of ISO 26262 and ISO 21434, the emphasis on safety and security cultures is clear. But are we fully considering the cultural dimensions that underpin our technical achievements? Are we investing enough in the development of soft skills, or is our focus solely on technical expertise? How well-balanced is the triad of quality, safety, and delivery within our organizations?
Helen invites all symposium participants to join the Culture Café, an interactive and thought-provoking workshop designed for automotive safety experts. This session will delve into the real-world challenges we face, offering a platform to reflect on the current state of our industry, exchange insights with peers, and explore actionable strategies. Learn from Arm's safety culture journey and contribute to shaping the future of automotive engineering. Let's push beyond the technical specs and dive into the cultural forces that shape our industry's success.

Helen Buchumensky
arm

Lessons Learned from a Decade of Reviews of large-scale Safety-Software Development

Modern automotive software development is complex. Design, implementation, and different types of static analyses, testing on different levels must be performed under high pressure.
And yet the most efficient and effective verification measure is a manual review.
This presentation is a summary of what worked and what didn't in the large-scale software development for Vector's Classic and Adaptive products aiming for high integrity (ASIL D).
It will give insights on the review process itself, the amount of covered code and repetition frequency, as well as the advantages and potential shortcomings of the approach.

Jonas Wolf
VECTOR

Overview and Discussion of Forward and Reverse Path Safety Strategies

The analysis of functional safety systems often separates the perspective of systematic and random HW faults early on. One might argue that if systematic faults are avoided and the metrics for random HW faults are achieved then functional safety is established sufficiently. However, this is not necessarily the case. Depending on how safety mechanisms are arranged in the functional safety system the safety mechanisms resemble either open loop control, closed loop control or a mixture of both. As known from control theory the open-loop case cannot detect or correct errors for outside disturbances unlike a closed-loop control system. In the case of functional safety this difference is not that obvious and can be overlooked as in both cases the HW metrics are numerically achieved.
This presentation provides an overview of how safety mechanisms can be placed in the forward and reverse path of a functional safety system modelled as a control system and discusses the advantages and disadvantages of the various strategies.

Dr. Christopher Temple

arm

Open discussion - How to interpret ISO 26262 for a specific problem

Dr. Rafael Zalman from Infineon will lead an open discussion how to interpret ISO 26262 for a specific problem. This problem will be disclosed at the beginning of the discussion.

Dr. Rafael Zalman

Infineon

Linux for safety-related applications – strategic alternatives on how to get to a solution and the value of cross-disciplinary

Dr.-Ing. Michael Armbruster
Federico Arrighetti
Elektrobit

High-performance computers (HPCs) are the central components of E/E architectures that enable Software-Defined Vehicles (SDVs). These HPCs require an adequate operating system solution. GNU/Linux is an ideal candidate for HPCs due to its customizable features and functionalities, as well as its large pool of developers. However, the quest for an automotive-grade Linux operating system that meets the stringent functional safety standards of the automotive industry, such as IEC EN61508 and ISO26262, has been a significant challenge. The primary motivation for the work described in this presentation is to address the core question: "What enables OEMs, Tier 1 suppliers, and integrators to utilize an automotive-grade Linux that compiles with requirements given by applicable functional safety standards, such as IEC EN 61508 or ISO 26262?"

This presentation outlines the implementation of a strategy leading to a Linux operating system solution that is compliant with these functional safety standards. This approach bridges the gap between the advantages of open-source software and the functional safety demands of the automotive industry, providing a qualified, reliable, and extensively maintained solution.

Systematic & Continuous Maintenance of Safety Certification

Matthew Storr
Michael Ho
Red Hat

We've shown that ISO26262 certification is a possibility for complex, pre-existing open-source software. Meaningful usage requires maintaining certification through regular updates and doing this on a large scale. We will discuss how to extend and operationalize Red Hat's tailored approach. We will demonstrate how the safety integrity of our software is maintained systematically and continuously over time.

Is Functional Safety achievable in an Open-Source ecosystem?

The presentation will answer the question covering the following:

- Introduction to the Eclipse Foundation
- General principles of OSS and EF values
- Introduction to the Eclipse SDV WG
- Is there a gap between “Corporate” and “Open source” projects & processes?
- How does the Eclipse SDV WG intend to bridge this gap?
- Motivation
- Methods - SDV Process & Maturity Badges Program
- Introduction to the Eclipse ThreadX project
- Usage readiness in Automotive Industry production
- Eclipse ThreadX
- Other Eclipse SDV WG’s projects

Dana Vede

ECLIPSE FOUNDATION

Security based on Open-Source – a preferable solution or a risk?

Security is an important aspect of vehicle safety. Update over the air is state of the art and just one example of an external interface for accessing the critical systems of today's cars. The amount of data traffic and thus the need for more storage space is immense and with it the need for encryption technologies at various levels.
The EU Cyber Resilience Act is one response to reduce the risks. It requires the implementation of security in hardware and software.
Who can we trust in terms of the technical solutions that are supposed to guarantee that they are resilient against almost all types of attacks? Security based on open-source IP is one option that will be discussed in this presentation.

Richard Willems

swissbit®

Heterogeneous packaging and Chiplets – an open cybersecurity design and manufacturing space for the automotive industry?

Torsten Grawunder
swissbit®

The chip design process with Chiplets fundamentally changes the meaning and requirements of advanced packaging. Against the background that Swissbit Germany AG acts as a semiconductor backend manufacturer, the technological transformation process (SoC, SiP towards SoP) for advanced manufacturing is described, including the new meaning of Open Advanced Packaging / Micro Integration Foundry as a model for a new advanced manufacturing platform.
The diverse challenges arising from the central idea of Chiplets in relation to D2D bus systems, Chiplet frameworks and the underlying design kits (CDK+ADK+WDK+SPDK) for multifunctional integration are described.
New architectural concepts in the chip packaging design process combine with new ECU flexibility through many advantages of reusable and standardized Chiplets. The system-on-package is a customized embedded SoC that combines COTS and custom chiplets with non-chiplet DIEs.
Cybersecurity concepts such as split manufacturing highlight another aspect of Chiplet technology, which requires a more holistic cybersecurity approach to consider existing functional safety aspects.
The biggest challenge is the reuse of existing software components with new hardware and software based Chiplet architecture models in a new supply chain, cost, yield, and ECU system model.

Automotive cybersecurity challenges from a growing OEM Startup's perspective

Nowadays, the automotive industry is facing significant cybersecurity challenges, especially with the implementation of ISO 21434 and adherence to UN Regulation R155. These norms and regulations require comprehensive cybersecurity measures across the entire vehicle lifecycle, from design to decommissioning. To comply with, the OEM must establish robust threat assessment and risk management processes. Additionally, integrating secure communication protocols and providing regular software updates are crucial to mitigate the cybersecurity threats. In this rapidly evolving landscape, we would like to share our startup's development approach and strategy for building a secure foundation of our electrified, connected and autonomous vehicles, striking the right balance between compliance and innovation in this complex regulatory environment.

Abdelillah Ymlahi Ouazzani

CEER

Symposium Location

Arabella Alpenhotel
Seeweg 7
83727 Spitzingsee

Registration Form ONSITE

I register for the:
***exida* Automotive Symposium 2024**

Date: October 23 - 25, 2024

Location: Arabella Alpenhotel am Spitzingsee
Seeweg 7
83727 Schliersee-Spitzingsee
Germany
www.arabella-alpenhotel.com

Price: € 1,895. -- + tax
The price includes the accommodation, food and beverages.*

Please enter the participant's billing address:

Company: _____

VAT-ID: _____

Participant Name: _____

Department: _____

Street. _____

Post code, city, country: _____

Participant Email: _____

Phone number: _____

Please send the filled page via email to kerstin.tietel@exida.com.
Booking conditions: The symposium will be held in English and the presentation slides will be in English. In case the registered participant sends a written cancellation 50 days before the start of the symposium the cancellation will be free of charge. Until 21 days before the start of the symposium a cancellation fee of 50% of the fee will be charged. For later cancellations done by registered participants the complete symposium costs will be charged. A replacement of the registered participant with another person is possible at any time. The acceptance of the conditions is part of the registration. *exida.com* GmbH reserves the right to cancel the symposium at short notice and in writing. In this case only the symposium fees will be refunded.

Data protection: The collected personal data is only stored and used for internal purposes related to the management of the training. This data is protected by limited access rights. The duration of the archiving depends on the legal requirements.

_____
Date Signature

* *Meals or beverages consumed outside of the planned dining will be billed separately on your own expenses*

Registration Form ONLINE

I register for the:
***exida* Automotive Symposium 2024**

Date: October 24 - 25, 2024

Location: Online

Price: € 990. -- + tax

Please enter the participant's billing address:

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VAT-ID: _____

Participant Name: _____

Department: _____

Street. _____

Post code, city, country: _____

Participant Email: _____

Phone number: _____

Please send the filled page via email to kerstin.tietel@exida.com.
Booking conditions: The symposium will be held in English and the presentation slides will be in English. In case the registered participant sends a written cancellation 14 days before the start of the symposium the cancellation will be free of charge. Until 7 days before the start of the symposium a cancellation fee of 50% of the fee will be charged. A replacement of the registered participant with another person is possible at any time. The acceptance of the conditions is part of the registration. *exida.com* GmbH reserves the right to cancel the symposium at short notice and in writing. In this case only the symposium fees will be refunded.

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Date Signature