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exida
Automotive Symposium 2025

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The automotive industry is currently navigating a challenging environment — making it even more essential to drive development forward with greater innovation, speed and efficiency. Critical questions unanswered in key areas such as

- Functional Safety
- Cybersecurity
- SOTIF (Safety of the Intended Functionality)
- Integration of AI

posing urgent challenges for engineers and decision-makers alike.

This year's symposium will once again bring together leading experts across these domains to explore cutting-edge developments and practical solutions. We'll also take a closer look at the growing impact of Artificial Intelligence, Big Data, and Free and Open-Source Software — technologies that are rapidly shaping the future of mobility.

Be part of the discussion. Engage in interactive sessions, build your network, and share your insights with peers from across the industry — all within a stunning natural setting that inspires innovation and reflection.

It will be our great pleasure to welcome you to the *exida* Automotive Symposium 2025.

In case of questions or need for assistance with the registration, please contact us.

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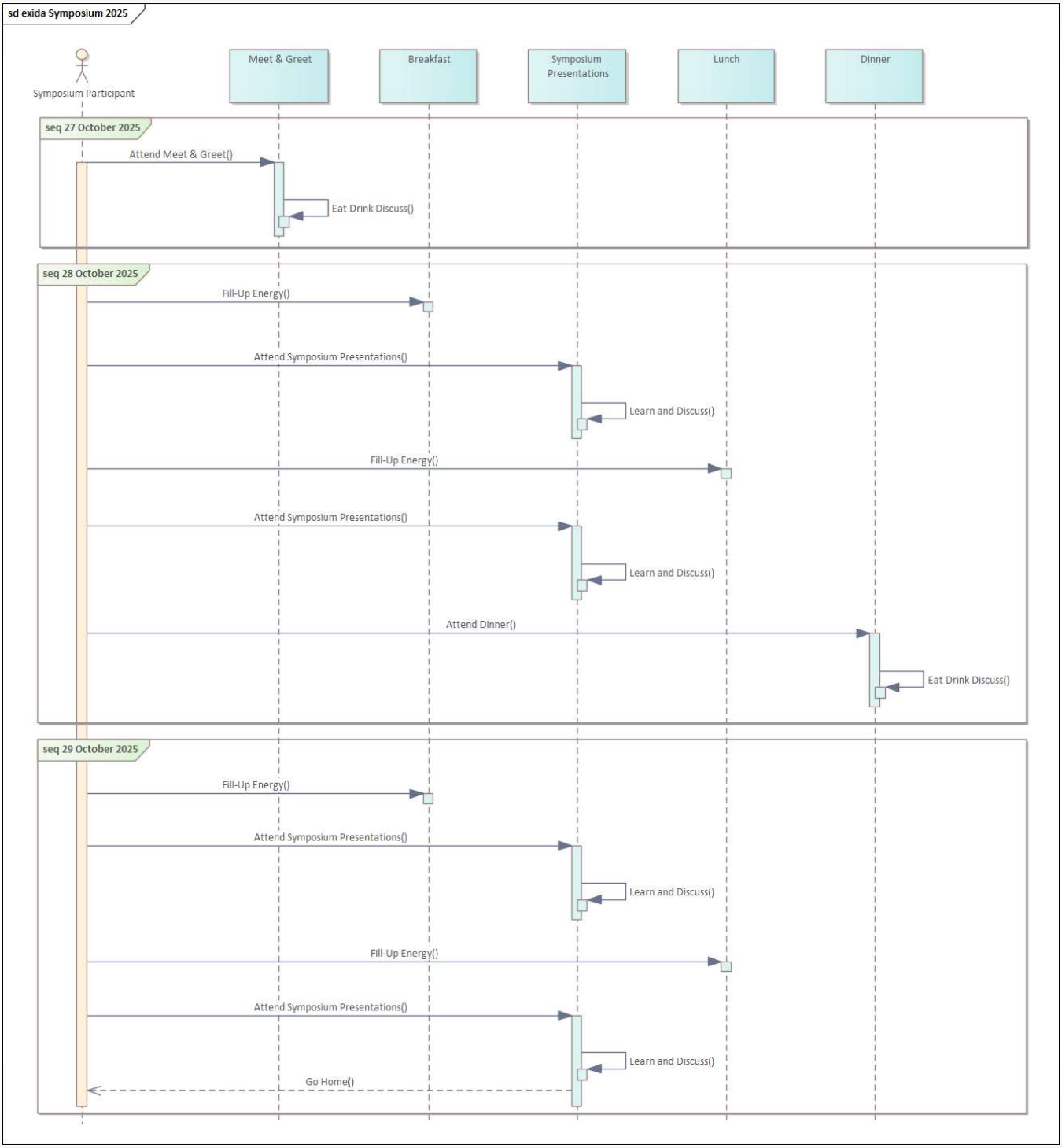
Symposium Schedule



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

On the next pages you will find the current agenda with the topics confirmed already. But there is still more to come.

Machine Learning Capabilities for Applications

Prof. Dr. Philip Koopman, Carnegie Mellon University

AI is no panacea. It remains critical to know where and how to apply machine learning in your next product. Phil Koopman, professor at Carnegie Mellon University, walks us through his thesis that AI is more fabrication than "hallucinating."

AI in Safety Assessment: From assistant to AI-ssessor? – An Interactive Workshop

Helen Buchumensky, Arm & Molly O'Brien, *exida*

As generative AI technologies advance, their application in safety-critical development is raising both excitement and essential questions. Can AI meaningfully contribute to the creation and review of safety evidence—or even support the safety assessor?

In this interactive workshop, Helen and Molly invite participants to explore practical use cases for AI in the safety lifecycle. Attendees will experiment with AI-generated artifacts in a simulated design project and compare them against expert-driven assessments. These hands-on exercises will spark discussion around trust, traceability, strengths, and current limitations of AI in safety.

Designed for safety engineers, assessors, and system architects, the session aims to define a realistic, responsible roadmap for integrating AI into safety assessment practices. Join us to evaluate where AI adds value, where human expertise remains critical, and how we can shape safe, future-ready development lifecycles together.

From Dataset to Deployment: Managing Machine Learning Lifecycle Risks for Safe AI Integration

Niketa Engineer, EMOTION3D

Machine learning is increasingly being used in safety-critical systems, but traditional safety methods often fall short in handling the uncertainty, complexity, and data-dependence of AI.

Let ‘s explore how to systematically manage safety risks across the ML lifecycle - from data quality and model robustness to deployment behaviour.

Through the lens of ISO PAS 8800, ISO 26262, and ISO 21448 (SOTIF), we explore how to build structured safety arguments, validate performance across the Operational Design Domain (ODD), and ensure models behave safely in real-world scenarios.

Key insights:

- A lifecycle view of safety risks in ML pipelines
- How ISO PAS 8800 supports argumentation for AI-based components
- Practical safety techniques for data, model, and deployment assurance

Safe Enough - practical acceptance criteria for AI Models

Molly O'Brien, *exida*

With the publication of ISO/PAS 8800 in December of 2024, the certification space for AI models in automotive applications is starting to be defined.

It is known that validation of the trained AI models must be done, but what kind of validation is sufficient? In this presentation, we will review the safety analysis guidance from ISO/PAS 8800 and why meeting the requirements of ISO/PAS 8800 can lead to insufficient validation. Then we will derive a quantitative framework for AI model validation that can be used for model acceptance and linked to safety requirements at the system level.

Statistical Validation of Automated Driving Systems

apl. Prof. Dr.-Ing. Moritz Werling, BMW

This presentation outlines the comprehensive safety framework that guided the development and regulatory approval of BMW's first SAE Level 3 Automated Driving System. By integrating qualitative and quantitative methods from Systems Engineering, Engineering Risk Analysis, Bayesian Data Analysis, Design of Experiments, and Statistical Learning, the framework effectively minimizes risks related to hardware and software faults, performance limitations, and specifications. Central to this approach is the identification and quantification of uncertainties in hazard scenarios, supported by Stochastic Simulation and Sensitivity Analysis. This rigorous process not only aligns with existing automotive safety standards but also sets the stage for future applications in SAE Level 2 systems, showcasing its versatility and effectiveness in enhancing safety assurance for Automated Driving Systems.

Explainable Statistical Evaluation of an ADAS Scenario with Automotive Standards using FASim Simulation Environment

Prof. Dr. Stefan-Alexander Schneider, Shreyas Nanikar, Patrick Svinger

University of Applied Sciences in Kempten

This presentation demonstrates how the Explainable Statistical Evaluation (ESE) framework can be applied to a standardized Advanced Driver Assistance System (ADAS) scenario using the FASim simulation environment. Complementing the earlier talk on BMW’s SAE Level 3 ADS safety case, this session focuses on the Euro NCAP “Car-to-Pedestrian Nearside Child Obstructed” (CPNCO-50) scenario, representing a critical use case for emergency braking. The Python-based FASim framework enables closed-loop simulation and integrates automotive standards such as ASAM OSI to create reproducible and parameterized test scenarios. Key safety metrics are derived via simulation-based test generation and evaluated through stochastic and sensitivity analysis, preparing the ground for Bayesian inference in subsequent reasoning steps. Developed in academic-industry collaboration, the work highlights how students can actively contribute to rigorous safety argumentation using state-of-the-art methods. The presentation is jointly delivered by Prof. Dr. Stefan Schneider and two master’s students Shreyas Nanikar and Patrick Svinger from Kempten University of Applied Sciences, and bridges theory, simulation, and practice in automated vehicle validation.

Bayesian Networks – A Practical Approach to Evaluating Automated Driving System Functions

Frauke Blossey, *exida*

Building on the presentation given at the 2024 exida symposium (“Explainable Statistical Evaluation of an Automated Driving System Functionality”), this talk will take a deeper dive into Bayesian Networks (BNs), which served as a central methodological approach in that previous work. Bayesian Networks have a wide range of applications - including fault diagnosis, risk assessment, AI and machine learning, robotics, and autonomous systems - and were first systematically introduced in the 1980s. BNs are used to represent uncertain knowledge in a structured and deductive manner. With the growing deployment of Level 3+ Automated Driving System (ADS) functions and the increasing need to demonstrate and quantify their performance - including associated uncertainties - BNs are gaining more and more relevance in the automotive sector. This trend motivates a closer examination of the method.

In addition to well-known methods such as data flow analysis and Fault Tree Analysis (FTA), the presentation will introduce Bayesian Networks: what they are, typical use cases, how they can be derived from data flow diagrams, and when they provide a valuable extension to FTA. The presentation combines elements of statistics, graph theory, and Bayesian reasoning. All concepts will be illustrated using practical examples to ensure clarity and accessibility for the audience.

Safety Case for a Linux-based OS, represented using the Eclipse TSF

Paul Sherwood, Codethink

This talk will explain the safety argument and rationale behind Codethink's Linux-based OS, and explain how the Eclipse Trustable Software Framework simplifies the approach to continuous certification.

Mixed-criticality human-machine/interfaces with displays driven by embedded Linux for safety applications

Michael Armbruster, emlix GmbH &
Federico Arrighetti, Elektrobit Automotive GmbH

Linux is finding its way into the field of secure, safety-critical and mission-critical systems. In this market, the needs are driven by the increasing complexity of the functionalities and the obligations dictated by standards, norms and regulations on safety and cybersecurity. The ever-increasing complexity and diversity of those demands, in addition to the advancements in hardware, ask for adequate HW/SW solutions. The industry is working on solutions based on embedded computing, and Linux is an ideal solution to provide the proper execution environment: safe, secure, maintainable long-term, and offering a broad support for different hardware.

An exemplary field of application is ”mixed-criticality“ human/machine graphical interfaces using displays, which pair non-safety-related information – typically 3-dimensional images – with safety-related information, typically ”telltales“ (icons). Those are standardized by ISO and other industry and regulatory bodies. This helps to ensure, that drivers will be able to interpret critical information the same way in different vehicles. But much more complex safety-related overlay-images can be expected in the future.

Throughout this presentation, the authors show a solution, that can be used to feed ”mixed-criticality“ human / machine interface displays from within a single embedded Linux virtual machine executing both safety-related and non-safety-related applications. The core elements of this approach are:

- Safety-related and non-safety-related applications run on the same Linux kernel
- Safety-related and non-safety-related applications write data to the frame-buffer interface of the display control unit. And the corresponding framebuffers are used within the HW-pipeline. Their contents are overlayed to produce one output image with safety-related and non-safety-related data.
- The protection of frame-buffer data used for safety-related images is “abstracted” from the safety-related applications. There is no need to add further measures to detect faults on application layer
- As such, the implementation is easy, achieves good performance and comes with only a minimal overhead to the applications.

The presented solution is based on the EB corbos Linux for Safety Applications, positively assessed, paired with conceptual ideas that address the specific field of ”mixed-criticality“ human/machine interfaces. It has the potential to significantly simplify implementation efforts and to improve performance while maintaining the level of confidence that the HW/SW-solution will perform the safety function correctly.

Mixed Criticality Container Isolation

Matthew Storr, Red Hat

The Red Hat In-Vehicle Operating System bases its mixed criticality isolation strategy on the use of Podman containers, a lightweight and secure container runtime. This decision is based on extensive experience Red Hat gained from hundreds of customer deployments that use Red Hat's Enterprise Linux product in high-stress and security-sensitive markets. Red Hat has shown that the isolation provided by the Podman containers is sufficient to address the freedom from interference needs of ISO 26262 up to ASIL-B.

Open Source Tailored Test Coverage Approach

Fabrizio Tronci, Red Hat

Certifying the Red Hat In-Vehicle Operating System, which comprises only open-source packages, necessitated a unique approach to measuring test coverage. Red Hat integrated both upstream testing and quality data with its own verification activity data into a comprehensive analysis, demonstrating a test coverage level equivalent to ISO 26262 ASIL-B.

The certification approach and key tailoring arguments advancing open source based safety projects

Jonathan Moore, *exida*

Open source has better collaboration techniques, better methods, and techniques that are superior to those used in traditional normative standards-based developments. This presentation is for those people interested in these ideas and how exida approaches certifications of software not developed with safety in mind.

Eclipse S-CORE: Achieving Functional Safety with Open-Source Software in Automotive

Markus Schu, ESRLabs, Eclipse S-CORE

The session explores the Eclipse Safe Open Vehicle Core (S-CORE) project, which describes an open-source software platform for automotive targeting automotive ADAS functions. S-CORE originated in June 2024 as a collaborative effort between OEM, TIER1, and TIER2 companies to prove that open-source software can meet safety-critical automotive requirements.

The presentation outlines the project's goals, roadmap and organization with cross-functional teams, establishment of common understanding, and development of a code-centric workflow that satisfies safety standards. Key challenges addressed include distributed teamwork, stakeholder management, standards compliance, and integration of open-source software (OSS) components through qualification processes. S-CORE demonstrates how combining OSS development practices with safety processes creates an environment that accelerates innovation while meeting automotive industry quality standards, providing a model that can be adopted by other projects requiring similar safety and security assurances.

Safety for DRAMs: A View from the MEMTONOMY Project

Prof. Dr.-Ing. Matthias Jung, Universität Würzburg & Steffen Buch, Micron

Autonomous driving demands real-time processing of vast sensor and AI data at the edge. To meet cost and energy efficiency requirements, automotive systems increasingly rely on consumer-grade components such as DRAM and Flash, which pose challenges in performance, energy efficiency, and functional safety. As AI accelerators require massive external memory bandwidth—reaching up to 1 TB/s for Level 4/5 autonomy—co-design of memory and accelerators becomes critical. This includes optimizing memory controllers and exploring new safety mechanisms. The BMBF project MEMTONOMY-2 aims to develop new system architectures using advanced memory technologies, improve reliability to meet ISO 26262 standards, and enable efficient memory-accelerator interaction. This talk will focus on the DRAM memory system.

Security for Embedded and OT Systems,
Defense in Depth – A trip down to the bits and bytes

Roland Marx, Swissbit

All ECUs in vehicles and production rely on storing assets like data, programs, parameters, secrets, event logs and many more in a safe and secure way.

There are multiple attack vectors depending on the system architecture and technology, and also many countermeasures are nowadays included in almost all MCUs.

Still many products have a very long lifespan and attack vectors and vulnerabilities emerge over time and here a vulnerability management is also one important pillar of a modern CSMS. But here, companies are mainly limited to software and firmware updates.

In the next years quantum computers will be available to break common encryption that form the backbone of modern communication and trust infrastructures, like PKI systems. While some of these challenges can also be handled with OTA updates, another approach could be to use detachable HSM Modules, that can come with key material and sidechannel-hardened dedicated crypto-Chips.

Over the last 20 years, Swissbit and Hyperstone have developed a great toolbox that extends the dimensions of freedom in many ways. So that the PQC issue, but also many generic issues can be tackled in a different way – enhancing security even in a retrofit approach for existing systems. Defense in depth, down to where the bits and bytes are stored.

Symposium Location

Arabella Alpenhotel
Seeweg 7
83727 Spitzingsee

Registration Form ONSITE

I register for the:
***exida* Automotive Symposium 2025**

Date: October 27 - 29, 2025

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.*

For registration until July 15th, 2025 we will grant a special discount of 25% (€ 1,421.25 + tax).

Please enter the participant's billing address:

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Post code, city, country: _____

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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.

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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 2025**

Date: October 28 and 29, 2025

Location: Online

Price: € 990. -- + tax

For registration until July 15th, 2025 we will grant a special discount of 25% (€ 742.50 + tax).

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Date Signature