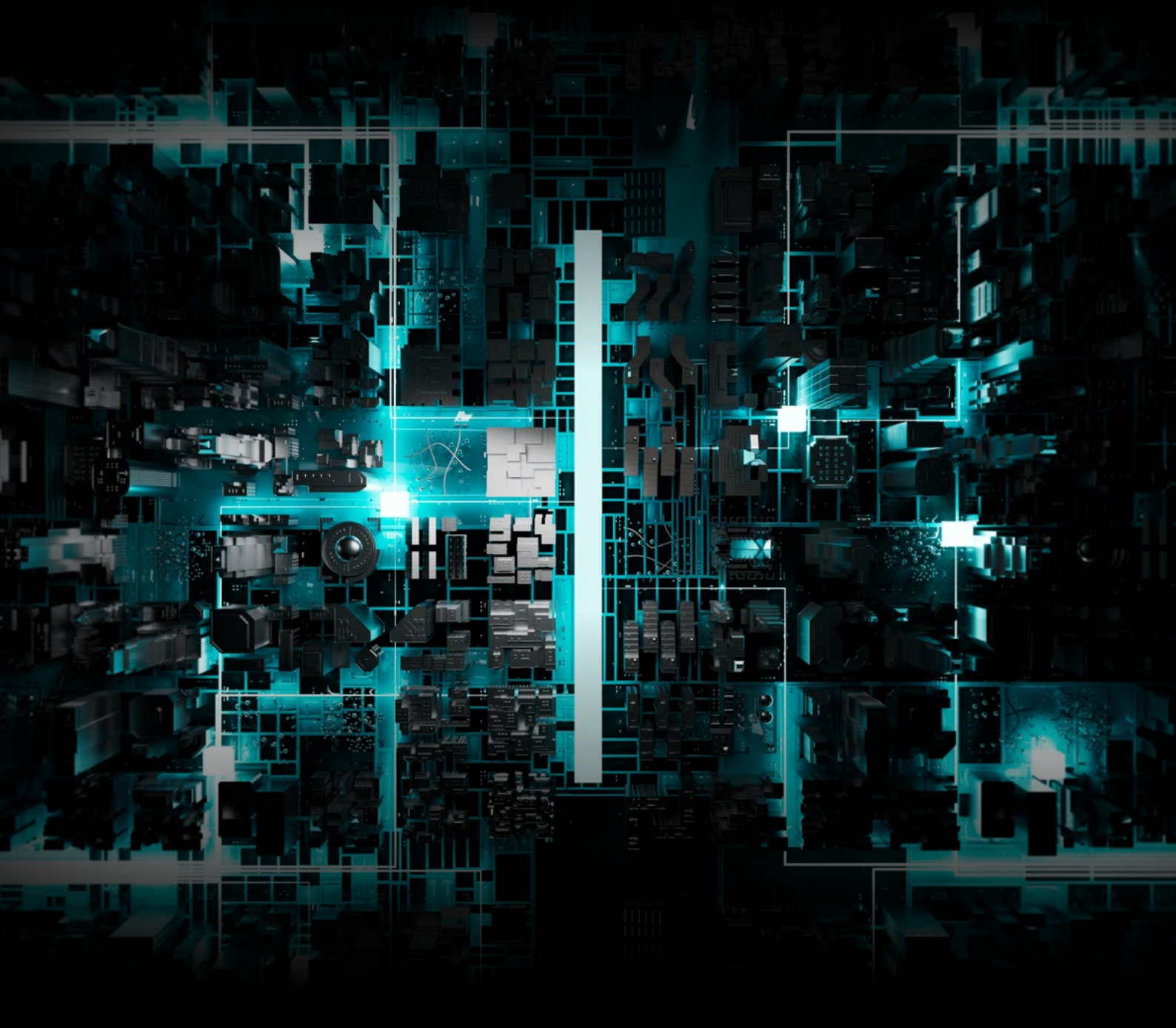
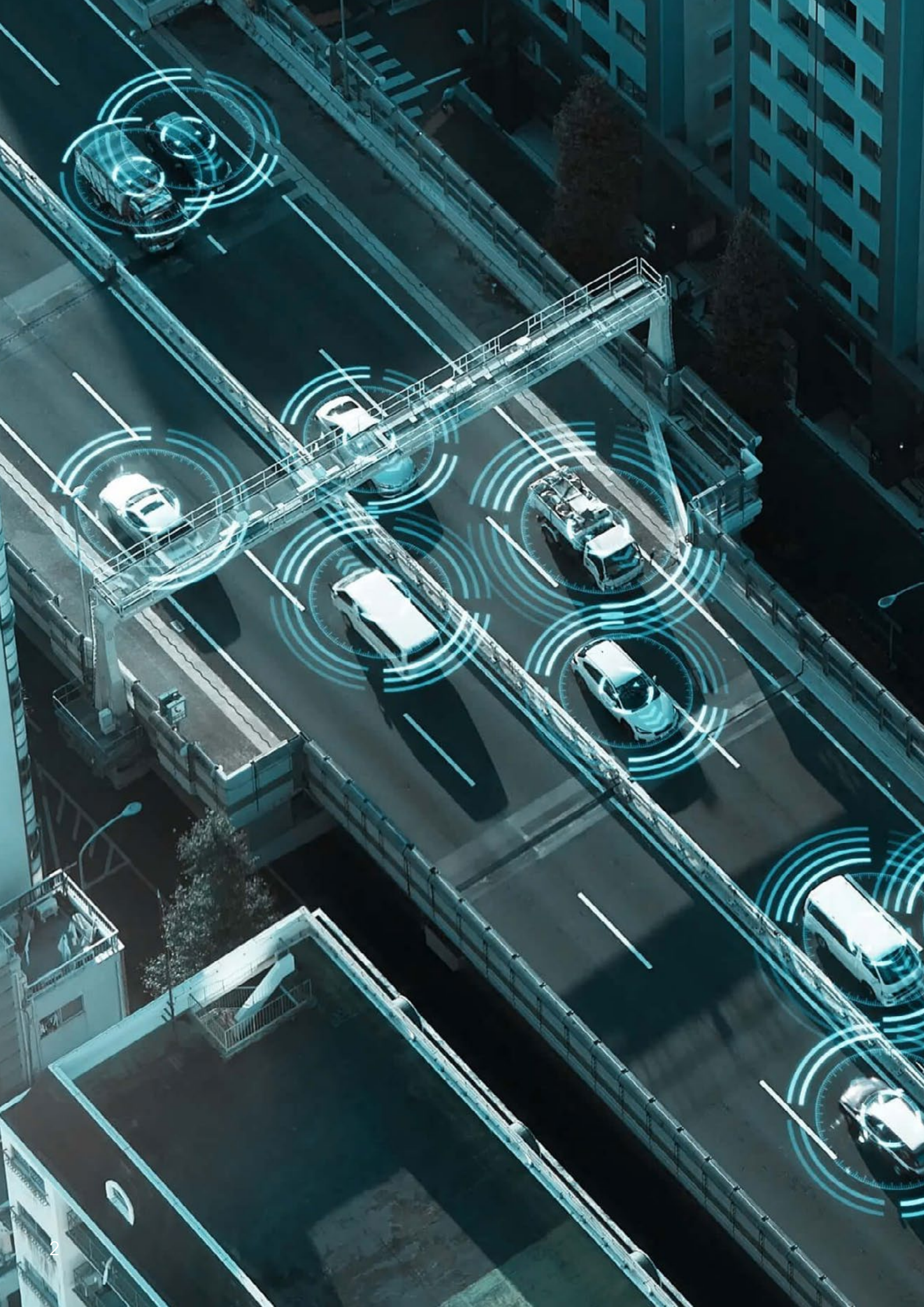
THE AUTONOMOUS

ANNUAL REPORT

2022





THE | AUTONOMOUS

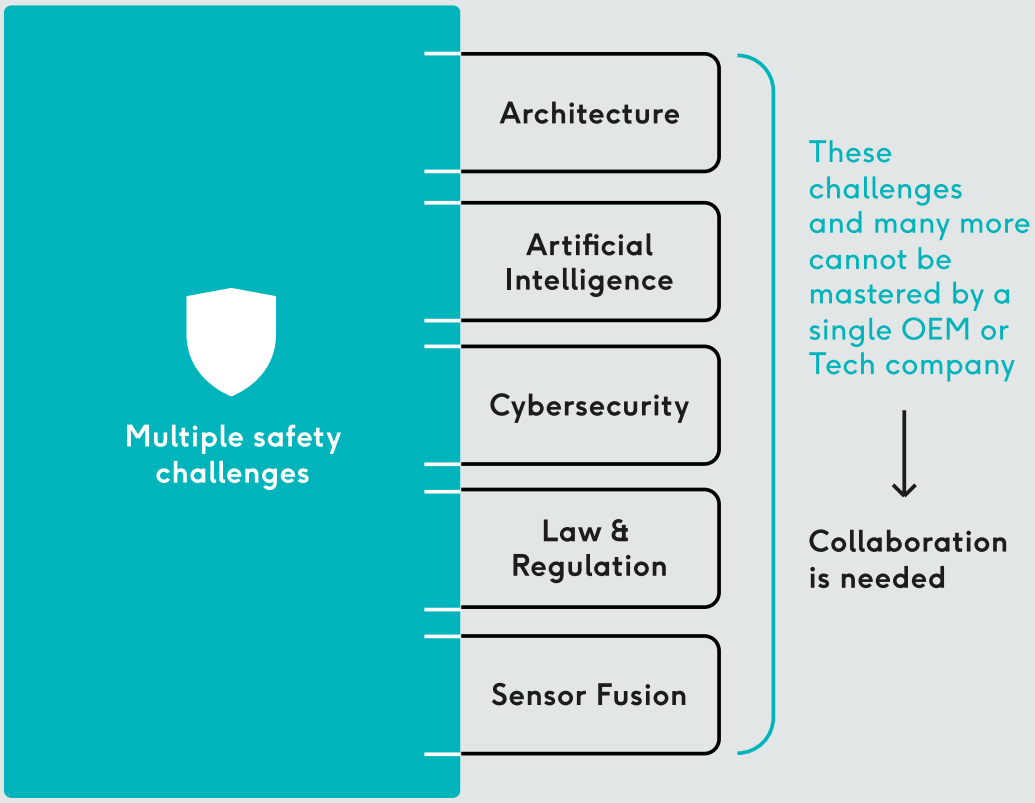
The Autonomous is the global community shaping the future of safe autonomous mobility. Initiated by TTTech Auto in 2019, The Autonomous is an open platform bringing together the chief executives and experts of the autonomous mobility ecosystem to align on relevant safety subjects.

The Autonomous promotes an environment of inclusiveness, involving very diverse stakeholders, such as OEMs, Tier 1 and 2 suppliers, technology companies, disruptors, governments, cities, legislators, regulators, and standardization institutions in order to ensure an integrated approach to the various autonomous mobility safety challenges. The goal of The Autonomous is to generate new knowledge and technological solutions in the field of autonomous mobility.

This report outlines The Autonomous‘ progress during the first three years. It also provides a glimpse at our plans to engage all stakeholders who share the same collaborative vision to join the growing ecosystem and actively solve the AV industry‘s biggest safety challenges.

We aim to provide transparency for our activities to all the Autonomous ecosystem supporters, members and contributors.

About The Autonomous



VISION

Transform mobility for a safer and more sustainable future.

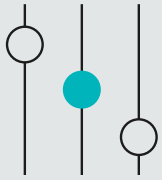
MISSION

Facilitate collaboration to solve the safety challenges in the autonomous mobility industry.

BENEFITS OF JOINING THE AUTONOMOUS

01 SAFETY

Increase the safety of autonomous vehicles

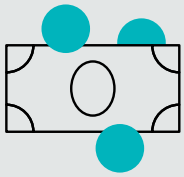


02 CONTROLLING RISKS

Decrease the individual liability risks by tightly working with governments and regulatory institutions

03 WISDOM OF THE CROWD

Develop better products through the wisdom of the crowd and accelerate the learning curve through peer-to-peer learning



04 COST REDUCTION

Reduce development costs, time to market, and risk of wrong development

05 ACTIVE CONTRIBUTION

The Autonomous members are sitting in the driver's seat

06 PROCESS STANDARDIZATION

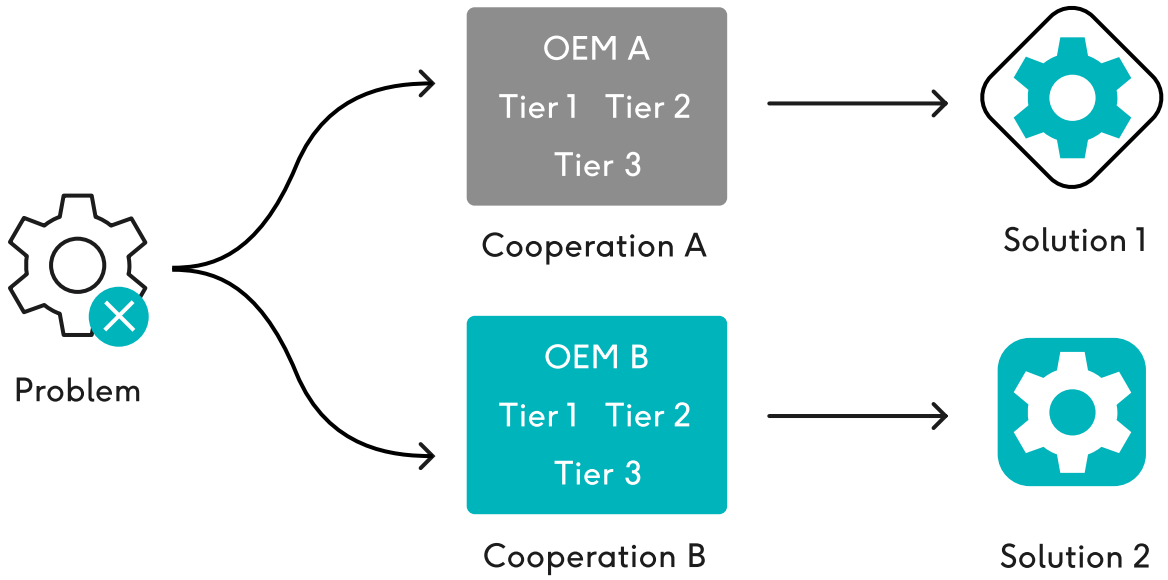
Avoid too many country-specific AV solutions

07 INCREASED CUSTOMER TRUST

Develop safe and best-in-class globally aligned reference solutions

THE APPROACH

CURRENT SITUATION



PROPOSED APPROACH

THE AUTONOMOUS INITIATIVE MILESTONES

2019

THE AUTONOMOUS KICK-OFF EVENT
@Vienna

2020 Further development of The Autonomous Event Stream

CHAPTER EVENT „SAFETY & ARCHITECTURE"
co-hosted by TTTech Auto

CHAPTER EVENT „SAFETY & REGULATION"
co-hosted by PSWP

CHAPTER EVENT „SAFETY & AI"
co-hosted by Five

CHAPTER EVENT „SAFETY & SENSOR FUSION"
co-hosted by Baselabs

CHAPTER EVENT „SAFETY & SECURITY"
co-hosted by Infineon

2021 Launch of The Autonomous Innovation Stream

KICK-OFF THE AUTONOMOUS WORKING GROUP "SAFETY & ARCHITECTURE"

The Autonomous Event Stream

CHAPTER EVENT „SAFETY & ARCHITECTURE"
co-hosted by Fraunhofer IESE

CHAPTER EVENT „SAFETY & SENSORS"
co-hosted by LeddarTech

THE AUTONOMOUS MAIN EVENT
@Vienna

2022 Further development of The Autonomous Innovation Stream

KICK-OFF
Working Group Safety of Embedded AI

KICK-OFF
Working Group Safety & Regulation

The Autonomous Event Stream

CHAPTER EVENT „SAFETY & SOCIETY"
co-hosted by McKinsey

THE AUTONOMOUS MAIN EVENT
@Vienna

Chairman's Address

We are proud to release The Autonomous Annual Report for 2022. As you will see, it has been a year of impressive achievements, despite the many obstacles facing the automotive sector, particularly the autonomous vehicle industry, for which safety remains the key challenge. Together with TTTech Auto, we initiated The Autonomous in 2019 with the vision of transforming mobility for a safer and more sustainable future and paving the way to autonomous vehicles on our roads. Nevertheless, we knew that this endeavor wouldn't be easy, and anybody who thought the transport revolution could be delivered on a schedule was wrong or simply underestimated the core technological, legal and social issues standing in the way.

2022 demonstrated that our mission is more valid than ever, and no one player alone can bring autonomous vehicles to market. A consolidated global cooperative approach is essential, which is why we strongly believe in our mission to facilitate collaboration in order to solve the safety challenges in the autonomous mobility industry. So, throughout this last year, we continued investing in our global community and engaged even more diverse and prominent key people and companies from the AV industry.

To name a few remarkable milestones in 2022:

- Guided by the motto, ACT TO IMPACT, The Autonomous Main Event 2022 gathered over 500 leading decision-makers and experts from more than 200 companies in the AV space. Held in person and virtually, our annual hybrid flagship event confirmed the urgency of collaboration to achieve safe autonomous mobility.

- The Autonomous Innovation Stream welcomed two new Working Groups, focusing on Safety of Embedded AI and Safety & Regulation. Led by Infineon Technologies, Working Group Safety of Embedded AI aims to build a common understanding of how to safely use AI for trajectory planning and control in automated driving. Our third Working Group, led by Regtech software company Kontrol and the renowned law firm PSWP, brings together vehicle manufacturers, software suppliers, academia, law companies, and testing organizations to develop recommendations for a harmonized AV regulatory landscape.

- In parallel, our first Working Group Safety & Architecture, established in June 2021, delivered its first preliminary results this year. The members evaluated and identified three different system architecture principles suitable for Level 4 autonomous driving. If you are an OEM or tech company with system-level expertise in functional safety and fail-operational architectures, you are now invited to evaluate and select the much-awaited final reference solution!

- Almost one year ago, we launched The Autonomous Ask the Expert podcast with the simple mission of covering honest conversations with well-known experts and decision-makers from our broad ecosystem. Together, we tackled some of the most frequently asked questions on the future of safe autonomous mobility. It's a real honor to host such inspirational talks and share knowledge with our growing community.

MESSAGE FROM RICKY HUDI AND PHILIP SCHREINER

Whether you're already a member of The Autonomous, an event partner, speaker, Chapter Event co-host, or contributing expert in our Working Groups and podcast, we are very grateful for your continued support in helping us build a much-needed global collaboration platform for the autonomous vehicle industry.

As we move into 2023, this collective effort must continue and even pick up speed to consolidate autonomous driving development and boost traffic safety. Therefore, The Autonomous will continue supporting the AV community pushing for building a cohesive collaboration ecosystem in the industry.

Will you join us in our goal of making safe autonomous mobility a reality?

RICKY HUDI

Chairman of The Autonomous

With over 30 years of experience in the automotive and technology industry, Ricky Hudi acts as Chairman of The Autonomous. Passionate about innovation and the development of autonomous driving technologies, Ricky is a true pioneer in the mobility sector. After holding various roles at BMW AG and AUDI AG he took over in January 2009 as EVP Development Electrical/Electronic AUDI AG. He also founded his own company "FMT – Future Mobility Technologies" and is leveraging a world-wide network of key players in the autonomous driving industry.

PHILIP SCHREINER

Head of The Autonomous

As Head of The Autonomous, Philip Schreiner is strongly engaged in partnership management, building together with his team a rapidly growing ecosystem around autonomous mobility. In his role, he is also responsible for the overall project implementation, preparing the ground for the various stakeholders to create a common understanding of global safety in autonomous driving.

The Autonomous Community in 2022


APTIV


ABA
INVEST
WORK
FILM
Your easy access to Austria


Fraunhofer
IESE


NXP


Elektrobit


ETAS


Green Hills
SOFTWARE


HEXAGON


McKinsey
& Company


Mercedes-Benz


NVIDIA


BMW


TTTechAuto


mobileye
An Intel Company


BASELABS
Data Fusion Results


VinAi

VOLVO

What we do

01 EVENT STREAM

The Autonomous Events facilitate discussions and networking for leading executives and experts from the autonomous mobility ecosystem, opening the door to collaboration to bring value to consumers and make sure autonomous transportation systems are safe.

02 INNOVATION STREAM

The Autonomous Innovation Stream facilitates cooperation across the industry to work on global reference solutions for various safety challenges. These reference solutions conform to relevant standards and aim to facilitate the adoption of safe autonomous mobility on a global scale. As part of the Innovation Stream, The Autonomous launches and facilitates Working Groups in order to bring about the co-creation of recommended practices and concrete developments.


THE AUTONOMOUS
DISRUPTION THROUGH
AUTONOMOUS MOBILITY
Karl Iagnemma
Aptiv
Karl-Thomas Neumann
KTN GmbH
Martin Varsavsky
Goggo Network
Michael Bültmann
HERE Technologies
Alex Hitzinger
VW Nutzfahrzeuge


INCREMENTAL CHANGE
Andrea Ketzer
Continental
Edzard Overbeek
Here
Alejandro Vukotich
Qualcomm
Young Sohn
Harman
Jody Kelman
Lyft


THE AUTONOMOUS

THE AUTONOMOUS MAIN EVENT

September 27th, 2022
Hofburg – Imperial Palace Vienna

The Autonomous initiative kicked off in 2019 with an unforgettable global event bringing together the autonomous mobility industry decision-makers. In the meantime, this global gathering has become the flagship event of The Autonomous initiative.

Over **500** executives and experts from the autonomous vehicle space join annually to discuss a vision for a safer and more sustainable future enabled by autonomous mobility. The leaders represent diverse companies and institutions, such as car manufacturers, technology companies, disruptors, governments, academia, regulatory bodies, non-profits, and more.

480

VISITORS

Total number of international on-site visitors

150

ONLINE VISITORS

Total number of livestream viewers

226

COMPANIES

+17

COUNTRIES REPRESENTED IN THE AUDIENCE

6 Panels | 4 Keynotes | 5 workshops

EVENT FEEDBACK SURVEY

★★★★★½ **5,5/6**

general event experience satisfaction

2022 | September 27th

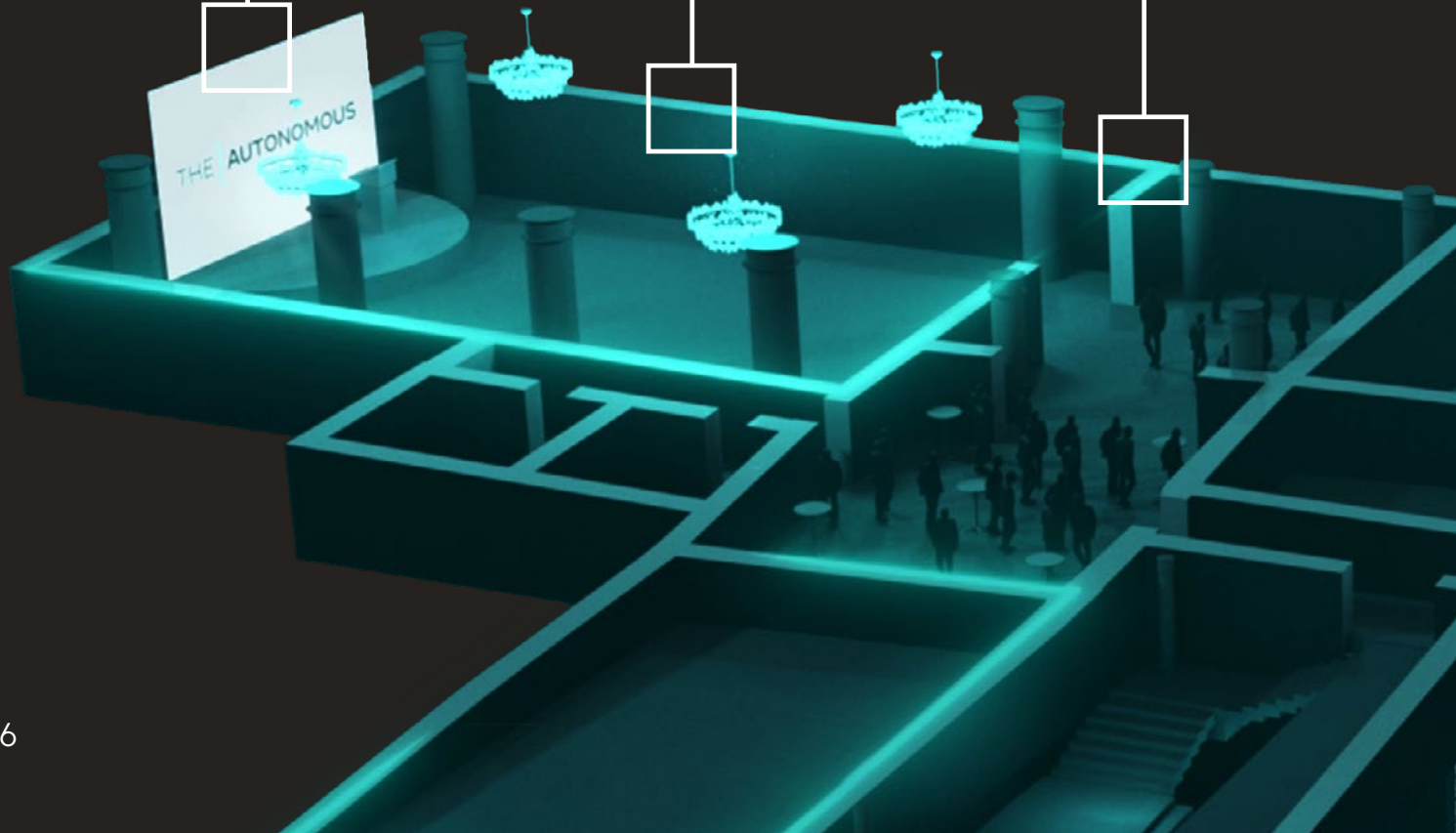
The Autonomous Hybrid Main Event

Guided by the motto **ACT TO IMPACT**, The Autonomous Main Event 2022 was all about taking action and showcasing concrete steps to work together towards a common goal: ***overcoming the multiple safety challenges facing the autonomous mobility revolution***. Attracting in-person and virtual attendees from all over the world, the main stage topics brought together an impressive speaker lineup. World-class decision-

KEYNOTES AND PANEL SESSIONS
In-person and virtual speakers joined us on stage physically and remotely

+400 INTERNATIONAL GUESTS
gathered in the Hofburg Imperial Palace in the heart of Vienna

NETWORKING BREAKS
allowed for personal interactions on-site



makers and leading experts touched upon how we can make Level 4 systems safe, the latest regulatory developments in autonomous driving, the impact of artificial intelligence and its limitations, but also the potential of data-driven development, the commercial viability of autonomous trucks and the first use cases of autonomous vehicles in both urban environments and on the highway.

The hybrid event combined a live in-person engagement with a virtual component and an online audience.

A CHAT FUNCTION

gave the opportunity to exchange with virtual attendees

+150 PARTICIPANTS

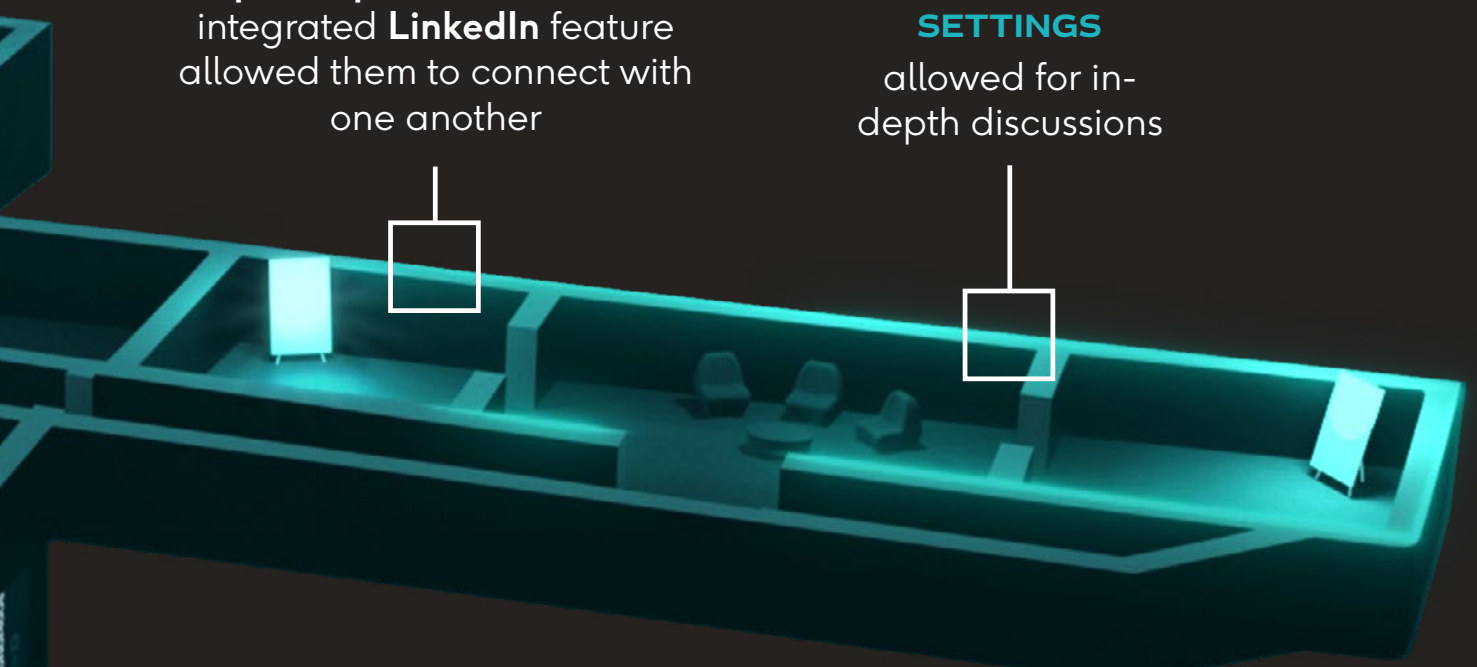
joined our The Autonomous virtual event platform - Keynotes and panel sessions were streamed to the virtual audience

PARTICIPANTS LIST

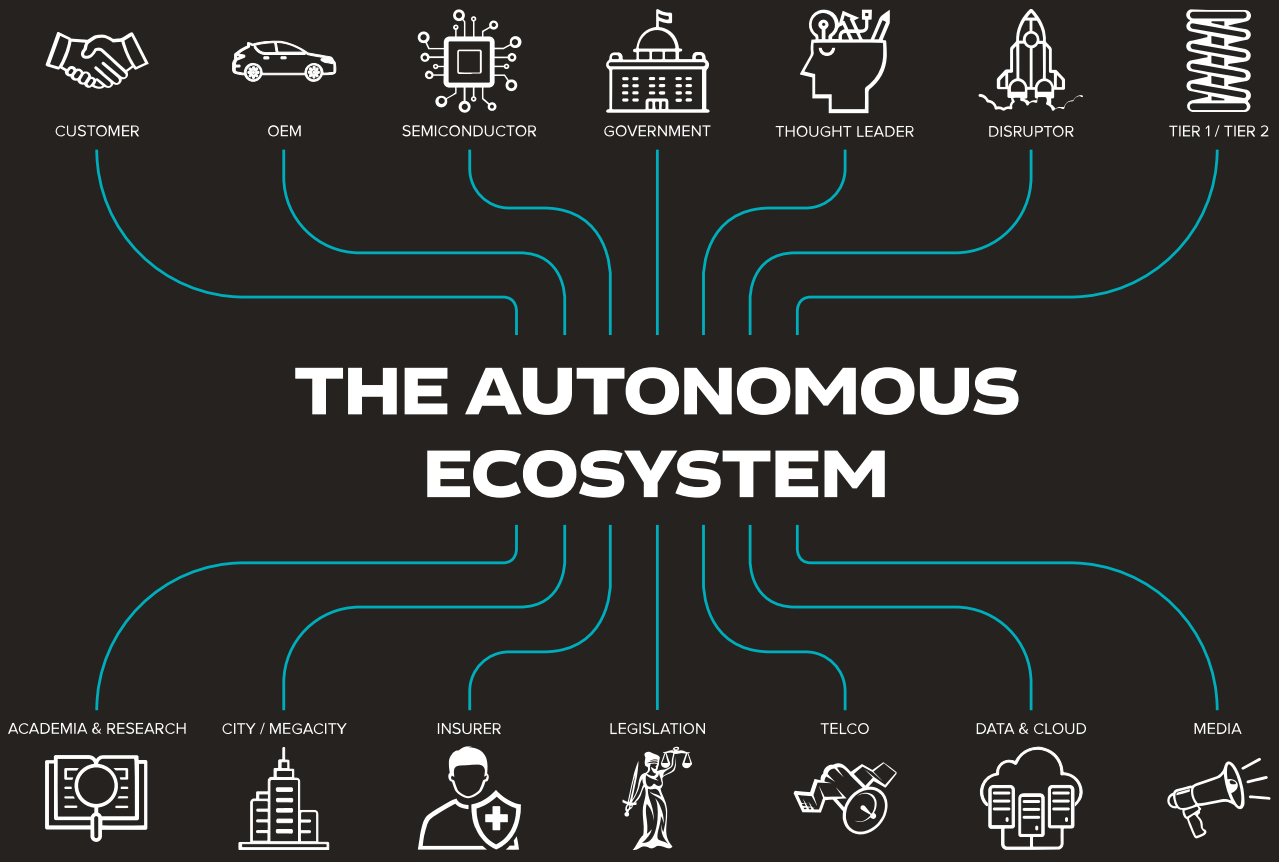
all virtual and in-person attendees had access to the **list of participants**, and a **NEW** integrated **LinkedIn** feature allowed them to connect with one another

WORKSHOP SETTINGS

allowed for in-depth discussions



ENGAGING DIVERSE STAKEHOLDERS



SPONSORS

All our sponsors are leaders in their domain and benefit from the high-profile attendees and the possibility of meeting them in person at the Main Event. The Autonomous provided a high-quality event with opportunities to engage, learn and exchange.

ABA Invest Work Film – Your easy access to Austria
BASELABS
CoreAVI – Innovating a Safer Tomorrow
Green Hills Software
HEXAGON
Infineon
kontrol
MathWorks
McKinsey & Company
TTTechAuto

THE EVENT COCKPIT

In 2022, we provided all in-person attendees with the opportunity to access the digital **Event Cockpit** through their personalized badges. Once the QR code on the badge was scanned, the participants could browse through the agenda, check out our fantastic speaker lineup, orient themselves via the digital event venue map, and connect with fellow attendees on LinkedIn by accessing the Participants List.

PANEL I

The Impact of Autonomous Systems on Urban and Highway Mobility

Andreas Tschiesner
Senior Partner at McKinsey & Company

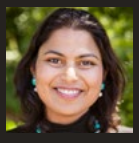
Christoph Hartung
Chairman of the Board of Management at ETAS GmbH

Bernhard Müller-Bessler
Head of Autonomous Solutions at Hexagon

Mike Potts
Chief Executive Officer at StreetDrone

PANEL II

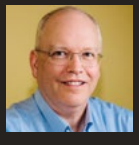
Rethinking Safety Concepts for Level 4 systems



Indu Vijayan
Director of Product Management at AEye

Stefan Poledna
CTO at TTTech Auto

Peter Schiefer
President of the Automotive Division at Infineon



Phil Koopman
Associate Professor at Carnegie Mellon University

Jens Kötz
Connected Architecture, Energy and Security Lead at Audi AG

PANEL III

Regulation in Autonomous Driving – are we moving fast enough?

Benedikt Wolfers
Founding Partner at PSWP

Bryant Walker Smith
Associate Professor at University of South Carolina

Michael Nikowitz
Coordinator for automated driving at Austrian Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology

Richard Damm
Chairman at UNECE Working Party on Automated, Autonomous and Connected Vehicles

Simon Fürst
Cooperation Manager Automated Driving at BMW Group

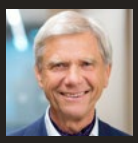
PANEL IV

The Impact of AI on Autonomous Driving – Opportunities & Limitations

Georges Massing
Vice President MB.OS Automated Driving, Powernet & E/E Integration at Mercedes-Benz AG

Riccardo Mariani
Vice President of Industry Safety at NVIDIA

Jens Petersohn
Product Management HPC Operating Systems at Elektrobit



Hermann Hauser
Partner at Amadeus Capital Partners

Raunaq Bose
CTO at Humanising Autonomy

PANEL V

Status and potential of Data Driven Development

Frank Han
Chief Software Architect at Changan Automobile

Lars Reger
CTO & Executive Vice President at NXP Semiconductors

Karsten Michels
Head of Product Line High-Performance Computer at Continental

Johann Jungwirth
Senior Vice President of Autonomous Vehicles at Mobileye

Marc Solsona Palomar
General Manager, Automotive Technology at Amazon Web Services

PANEL VI

The race towards trustworthy autonomy – is the trucking industry overtaking passenger cars?

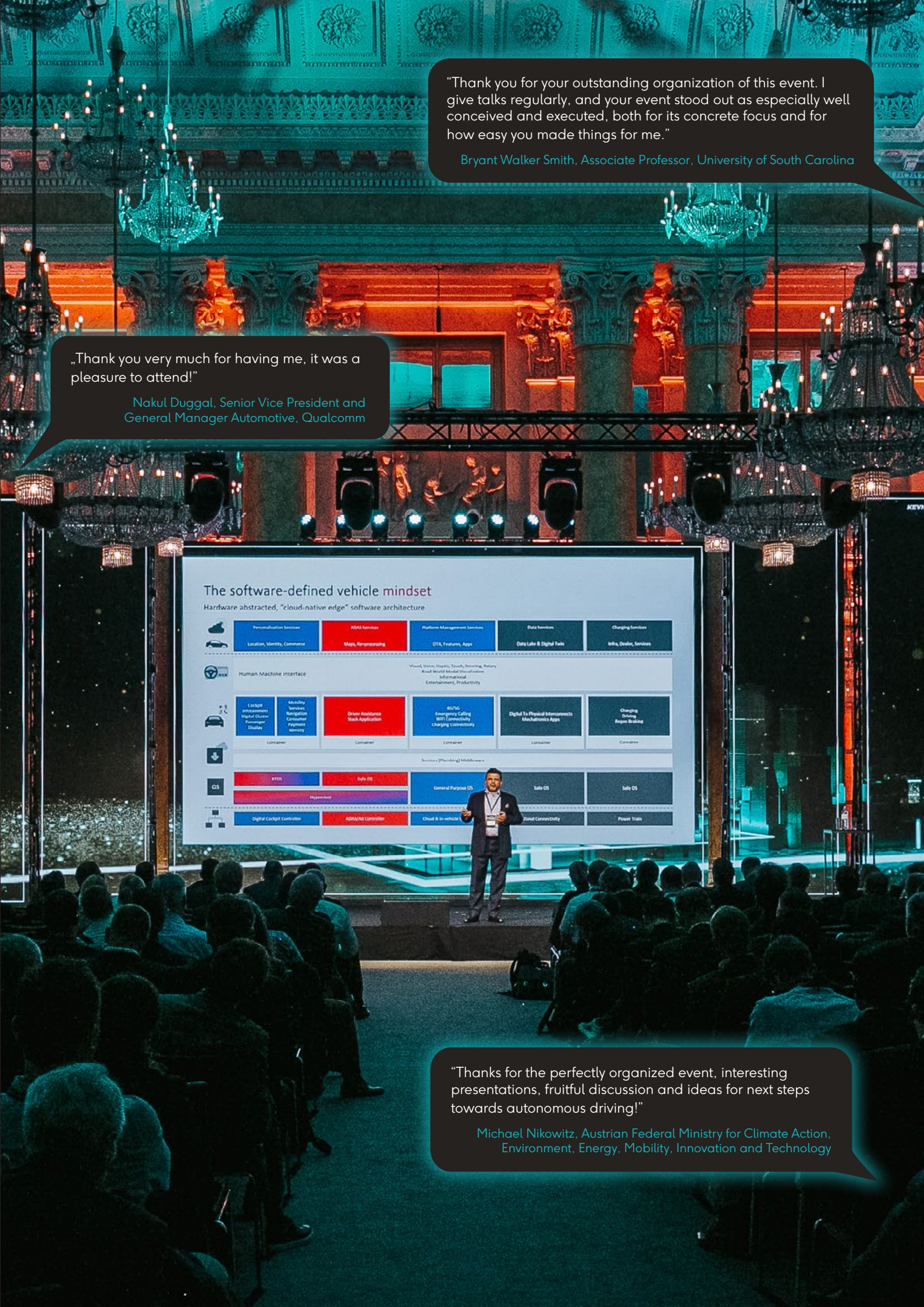
Annie Lien
Deputy CEO at VinAI

Essa Al-Saleh
CEO and Board Member at Volta Trucks

Håkan Schildt
Senior Vice President at Traton Group

Andreas Hille
Executive Vice President Land - Product Management and Engineering at PALFINGER Group

Magnus Liljeqvist
Global Technology Director at Volvo Group



"Thank you for your outstanding organization of this event. I give talks regularly, and your event stood out as especially well conceived and executed, both for its concrete focus and for how easy you made things for me."

Bryant Walker Smith, Associate Professor, University of South Carolina

„Thank you very much for having me, it was a pleasure to attend!"

Nakul Duggal, Senior Vice President and General Manager Automotive, Qualcomm

"Thanks for the perfectly organized event, interesting presentations, fruitful discussion and ideas for next steps towards autonomous driving!"

Michael Nikowitz, Austrian Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology

Workshop I

Safety & Sustainability

co-hosted by McKinsey&Company

Mobility is about to become a cleaner, more convenient, and safer experience. Within this workshop, we discussed the impact of ADAS and autonomous driving on safety and sustainability and ways to measure and compare the safety and sustainability impact.

Workshop II

Safety by Validation & Verification

co-hosted by MathWorks

Safety is one of the defining forces for the development and commissioning of autonomous systems. This workshop sought to initiate a dialogue on the current methods being employed to achieve functional safety and SOTIF for autonomous systems. Diving deeper, we discussed the use of virtual engineering and how virtual hardware platforms and vehicle models enable verification and validation of the intended functionality.

Workshop III

Safety of Embedded AI

co-hosted by Infineon

In 2022, The Autonomous welcomed Infineon Technologies as Lead on the topic of Safety of Embedded Artificial Intelligence, thus preparing to open up a new Working Group, which aims at creating a common understanding of how to use AI safely for trajectory planning and control. Both planning and control can be enhanced with AI to reduce costs, and increase energy efficiency and passenger comfort. This workshop invited participants to join the ongoing conversations and discuss potential technical reference solutions.

Workshop IV

Safety & Regulation

co-hosted by Kontrol

Autonomy brings the car to a new level. Machines have different capabilities for handling traffic situations than humans. Legal frameworks need to be adapted to be safer for humans and automated vehicles. The laws are written for human interpretation, and there is no straightforward way of "teaching" these laws to an autonomous vehicle. While autonomous driving developers are struggling with this, regulatory bodies are also looking for ways to verify autonomous system behaviors on the road.

This workshop provided an overview of the latest regulatory developments in the AV space and presented potential approaches to the above-mentioned challenges.

Spotlight Session

European Commission - Technology & Research

co-hosted by TTTech

This workshop presented the state-of-the-art challenges of the latest AV technologies and the Research & Innovation programs that the European Commission has set up to tackle those challenges. Furthermore, the industry's viewpoint was used to start an open discussion among participants.

"The mobility industry is facing a historical chance. The time to act is now! Let us not wait until harmful accidents force us to collaborate. Safety of autonomous mobility is not an area to compete or compromise on. Safety is about getting it right!"

Ricky Hudi
Chairman of The Autonomous

"It's very clear that we need to have redundancy; no single chip, sensor or software component can do it alone. We need to make sure that any single failure can be mitigated."

Stefan Poledna
CTO of TTTech Auto

"A safe human driver is the result of a complex, fantastic collaboration between eyes, ears, hands, feet, brain, and nerves. So what other than collaboration in the development of safe autonomous mobility can bring us closer and probably even beyond a safe human driver?"

Benedikt Wolfers
Founding Partner, POSSER SPIETH WOLFERS & PARTNERS (pswp)

"Autonomous driving offers far more than taking your hands off the wheel. It opens the door to truly green mobility. At The Autonomous Main Event, I had the pleasure to detail how semiconductors are shaping this evolution. With increasing intelligence and optimized solutions, an autonomous car increases convenience – and also becomes safer than a human driver. However, digitalization is not only reshaping the entire mobility experience, it makes a major contribution towards "Vision Zero". Smart mobility also drives decarbonization as an autonomous car becomes greener in its driving behavior and reduces the energy consumption of transportation."

Andreas Urschitz
CMO, Infineon Technologies

"We need to set the scene together very clearly. No one can do it alone. What we are doing on autonomous driving is a decade's job."

Markus Heyn
Member of the Board of Management and Chairman of Mobility Solutions at Bosch

"As we approach L4, the increasing number of ODDs representing various use cases, both cultural and geographical scenarios, will require intentional data sharing across the autonomous driving full stack in order to learn from each other and create solutions that advance safe autonomy."

Indu Vijayan
Director of Product Management, AEye

"The potential for autonomous vehicles to improve safety and provide equitable access to transportation is best achieved via all stakeholders collaborating on these basic requirements, with competition optimizing other aspects of deployment."

Phil Koopman
Associate Professor at Carnegie Mellon University

"I think collaboration in autonomous driving is essential. There will be no one who will be able to succeed alone. So, we have to use the strength of every single partner. Bringing different players together will help us provide the best solution for the world."

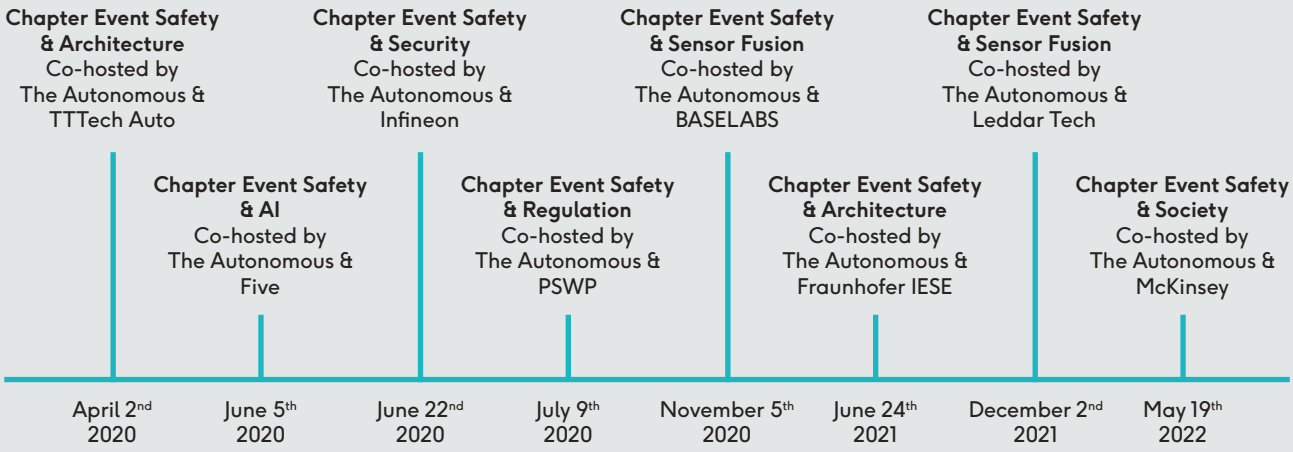
Georges Massing
Vice President MB.OS Automated Driving, Powernet & E/E Integration at Mercedes-Benz

01 EVENT STREAM

CHAPTER EVENTS

With The Autonomous Chapter Events, we are **connecting the leading technical experts of the autonomous mobility field** to identify common **safety challenges** within multiple areas, some of which are architecture, AI, cybersecurity, regulation, sensor fusion, and more.

Co-hosted by a relevant player in the AV industry, each Chapter Event is packed with exclusive insights on a specific hot topic related to autonomous vehicles and serves as a basis for long-term collaboration within The Autonomous Community and Innovation Stream.



Summary of all The Autonomous Chapter Events that were organized so far

CHAPTER EVENT

2022 | May 19th

Chapter Event Safety & Society

co-hosted by McKinsey & Company

McKinsey & Company

Mobility will become a more convenient, safer, and cleaner experience. This will not happen 10 or 15 years from now. We are already in the middle of a transition, meaning fewer cars and less individual mobility. The change is not only affecting the players along the autonomous driving value chain but also the society overall and cities in particular.

On May 19th, 2022, The Autonomous and McKinsey & Company hosted a virtual Chapter Event on "Safety & Society" to explore the impact of self-driving cars on our society and quality of life in urban areas.

The event focused on 3 key themes:

CUSTOMER ACCEPTANCE

Customer acceptance is one of the biggest drivers of autonomous vehicles adoption. The following topics were discussed:

- How does society see autonomous driving nowadays?
- How will customers receive increasing levels of autonomy, and – most importantly – how can the autonomous driving ecosystem make sure that customers accept the technology change?

URBAN MOBILITY

Autonomous driving will change how mobility is used in cities and provides alternatives to private cars, likely integrated with public transit. In this session, the panelists answered the following questions:

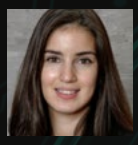
- What are the implications of autonomous driving on the mobility mix?
- How will autonomous driving re-shape how cities look in the future?

SUSTAINABILITY

Without regulation, lower price points for individual autonomous mobility modes could increase mobility and thus increase traffic. On the other hand, purpose-built autonomous vehicles for Mobility-as-a-Service offer new ways for players to introduce circular vehicle concepts bearing the higher cost of an end-2-end CO2 neutral vehicle. The speakers discussed the implications of Mobility-as-a-Service using autonomous driving on the environment and how to improve this impact.

SPEAKERS

The virtual Chapter Event assembled a diverse lineup of speakers – leaders in business & technical roles from world-class organizations such as:



Viktoriya Kolarova
Research Associate and Project Leader, German Aerospace Center (DLR)

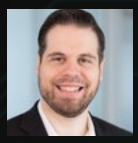
Joel Franklin
Associate Professor, Director Transport Science,
KTH Royal institute of Technology

Niklas Niemann
Associate Principal Operations & Sustainability –
Lead of the Horizontal Sustainability,Volkswagen Consulting

Florian Petit
Founder of Blickfeld

Carter Stern
Senior Government Affairs, Cruise

Jan Tijs Nijssen
Manager Corporate Strategy, Nederlandse Spoorwegen
(main passenger railway operator in the Netherlands)

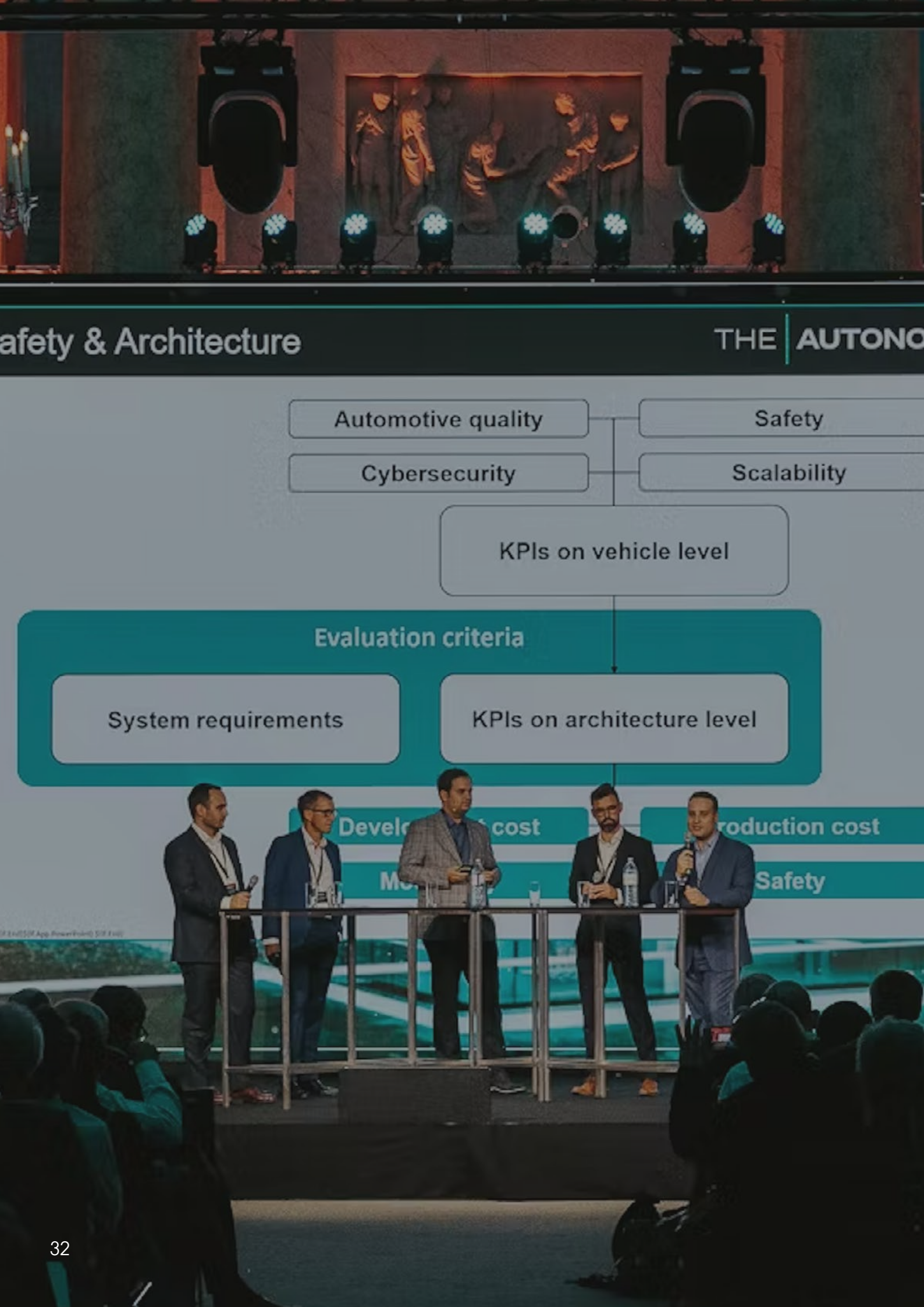


Johannes Deichmann
Partner at McKinsey & Company

Kersten Heineke
Partner at McKinsey & Company, Center for Future Mobility in Europe

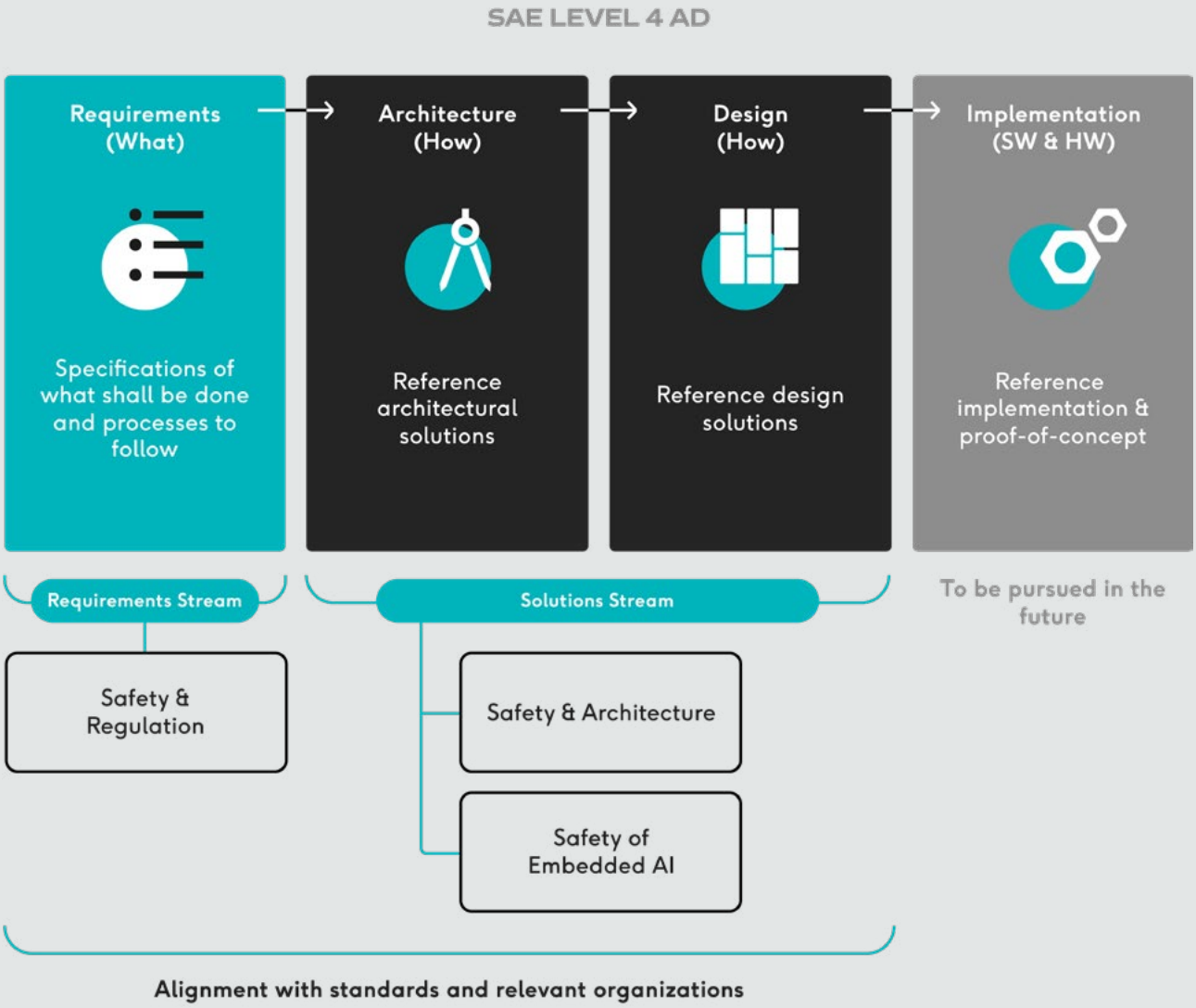
Ruth Heuss
Senior Partner at McKinsey & Company

DOWNLOAD IN-DEPTH REPORT HERE


afety & Architecture
THE AUTONO
Automotive quality
Safety
Cybersecurity
Scalability
KPIs on vehicle level
Evaluation criteria
System requirements
KPIs on architecture level
cost
roduction cost
Safety

THE AUTONOMOUS KICKED OFF TWO NEW WORKING GROUPS

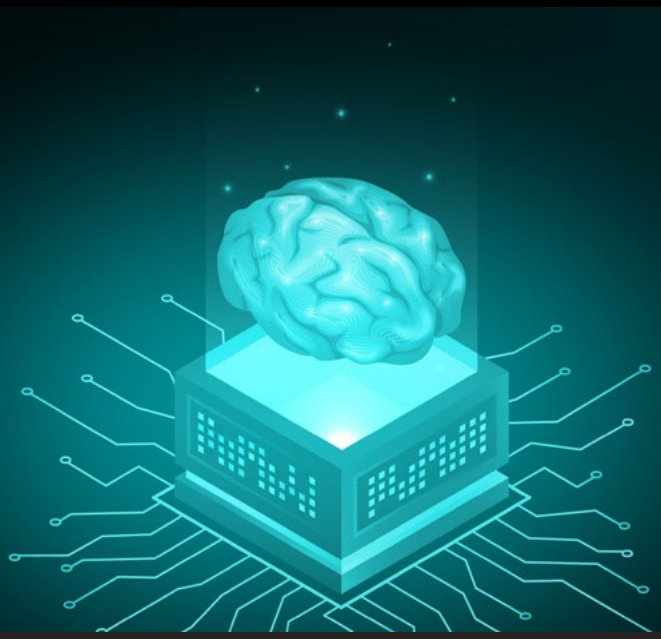
In 2022, we announced two new Working Groups, calling on major industry players to participate. The two Working Groups will focus on Safety of Embedded AI and Safety & Regulation.



THE AUTONOMOUS
Working Group
Safety of Embedded AI

Co-hosted by

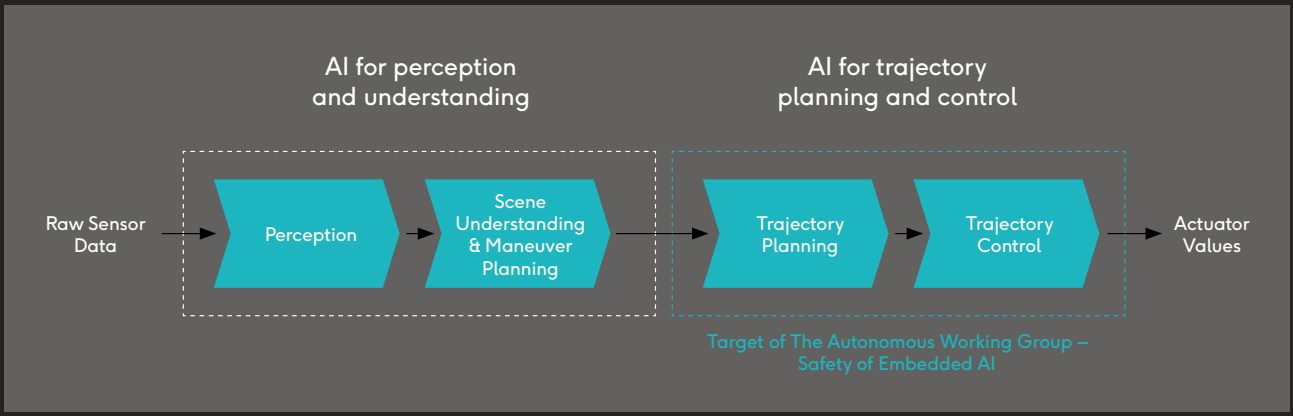
Infineon



In 2022, The Autonomous welcomed Infineon Technologies as Lead on the topic of Safety of Embedded Artificial Intelligence, thus opening up a new Working Group, which aims at creating a common understanding of how to use AI safely for trajectory planning and control in automated driving.

Artificial intelligence is gaining ground in more and more areas of our everyday life, and it has become clear that it is also a key enabler of autonomous vehicles. It provides the additional algorithmic capabilities required to bring advanced autonomous driving features into the mainstream.

Dependability (in particular Safety) is one of the most important attributes of a computation chain in automated driving. As shown in the figure below, the computation chain consists of perception, scene understanding, trajectory planning, and trajectory control.



WORKING GROUP SCOPE

While artificial intelligence is already widely accepted for perception and scene understanding to increase dependability, the use of AI for trajectory planning and control is relatively new. As a matter of fact, there are currently no initiatives focusing on creating a common understanding of how to use AI safely for trajectory planning and control.

To close this gap, Infineon Technologies calls on global key industry players and research institutes to collaborate and join forces under the umbrella of "The Autonomous." This will open the door to using embedded AI for new use cases and efficiently deploying AI-based functional systems for highly automated and autonomous driving.

NEW BENEFITS FROM EMBEDDED AI FOR TRAJECTORY PLANNING AND CONTROL

AI can both complement and enhance existing classical algorithms for planning and control. It has the potential to describe complex characteristics of the system and its environment, thus improving trajectory planning and control in terms of accuracy and reduced execution time.

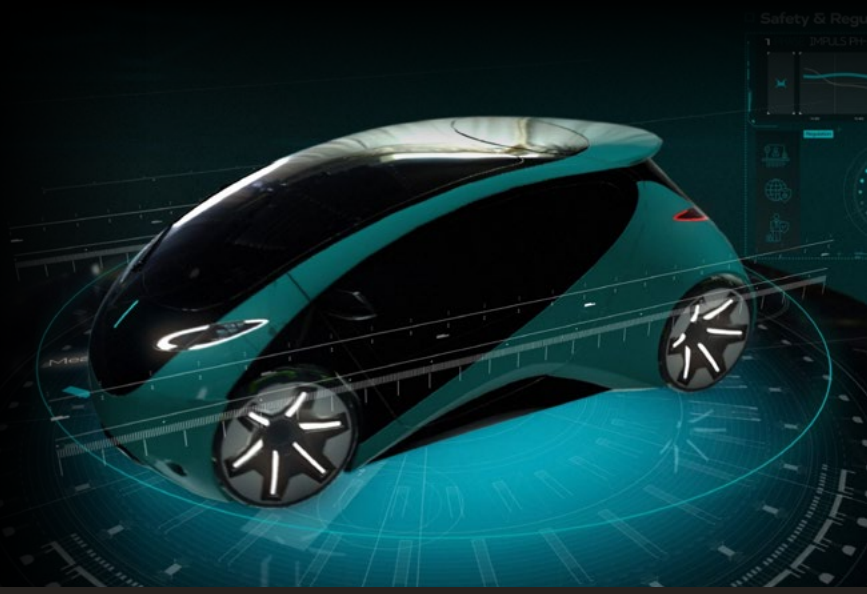
For planning, this benefits the quality of the planned trajectory in that it may be more energy efficient or more comfortable for the passenger.

For control, AI can be the means to follow a planned trajectory more closely, thus bringing the carefully planned trajectory onto the road.

THE AUTONOMOUS
Working Group
Safety & Regulation

Co-hosted by

kontrol pswp



The most recent Working Group Safety & Regulation kicked off under the direction of Regtech software company Kontrol and the renowned law firm PSWP, focusing on autonomous vehicle regulation and certification. They will be supported by the testing alliance IAMTS (International Alliance for Mobility Testing and Standardization) to discuss current developments in regulation, homologation and certification for autonomous and automated systems with a focus on the value chain in the automotive industry.

CURRENT STATUS OF REGULATION FOR AUTONOMOUS DRIVING

The regulatory environment for the automotive industry has drastically evolved during the last couple of years. The current situation is that the first regulations for connected and automated driving capable vehicles are in force (i.e., Germany, UN R155-157, (EU) 2019/2144). It is the industry‘s turn to catch up by developing its products in compliance with the regulations. The provisions in place so far are merely starting points and a substantial amount will be added both locally and internationally in the ensuing years. These regulations‘ primary objective is to promote safe mobility and public acceptance, which encompasses everything from traffic accidents on the road to environmental safety.

The successful and safe deployment of advanced driver assistance systems (ADAS) and autonomous driving (AD) technologies across the globe is considered one of the most significant challenges in the mobility industry. Undergoing the typical hype cycle, billions of dollars have been spent developing self-driving vehicles, leading to geofenced commercial and increasingly driverless operations in selected environments.

Regulatory bodies have long struggled to find the right approach to laying the relevant groundwork for deploying such impactful technologies in public use. From the self-certification of automobile manufacturers and state-by-state approvals, such as in Nevada, California, or Arizona in the United States, to a more certification-driven environment in Europe, the landscape of legal requirements, standards, norms, and court rulings, provides significant challenges for all market participants.

In parallel, established car makers (OEM) face threats by new entrants in successfully continuing their gradual roll-out of highly automated and driver assistance functions (SAE levels 2 and 3) up to competing with autonomous driving technology companies for fully self-driving fleets (SAE level 4).

It is essential that vehicle manufacturers, suppliers, testing organizations and law companies collaborate to formulate recommendations for suitable autonomous driving regulations and, thus, close the gap between industry and authorities.

WORKING GROUP SCOPE

In this Working Group we will discuss:

- What are current challenges, developments, and practices in compliance, validation, and standardization?
- The new world of autonomous driving will always overlap with the old world of conventional driving: What is the best regulation for both conventional and autonomous vehicles, with and without a human driver?
- Which requirements do driving systems have to meet to be street legal and how?
- What are the challenges and differences in the rule perception of humans and machines?
- Since real life in traffic is not always easy and not foreseeable, there are rules out there using pretty vague terms such as “Overtaking is not permitted in case of unclear traffic situation”. Can an autonomous vehicle execute such indeterminate rules? What should be done?

THE AUTONOMOUS
Working Group
Safety & Architecture

Co-hosted by

TTTechAuto

In 2022, our first Working Group Safety & Architecture, led by TTTech Auto, reached an important milestone and is now one step closer to a reference solution!

Launched in June 2021, The Autonomous Working Group Safety & Architecture brings together diverse companies and academia to define the state-of-the-art system architecture for safe self-driving cars, and more precisely, for an SAE Level 4 Highway Pilot.

Last year, the Working Group members succeeded in completing the second report increment, which focuses on identifying and analyzing various system architectures for ADAS and AD functions. “We worked together with industry participants on formulating a conceptual architecture for a reference AD feature, in this case, a Level 4 highway pilot,” said Working Group Chairman, Christoph Schulze. The next phase is the evaluation; Mr. Schulze encourages full ecosystem participation, “especially car manufacturers to bring in their requirements and thoughts concerning safe system architecture and design.”

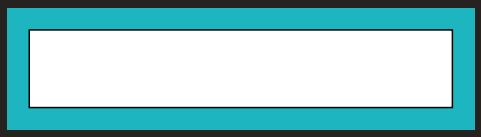
The Working Group members developed clear criteria for the evaluation process that allowed them to rank any conceptual architecture against a given KPI. The developed KPIs are organized into several categories. Below are some examples of these categories:

- Safety
- Automotive Quality
- Scalability
- Development Cost
- Production Cost
- Modulatory

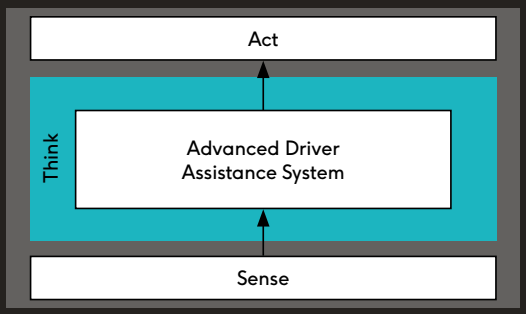
CONCEPTUAL SYSTEM ARCHITECTURE CANDIDATES

Our Working Group is screening conceptual system architectures proposed by commercial and academic players. So far, we have identified several candidates falling into three major categories:

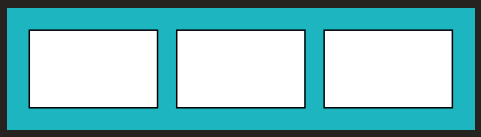
Monolithic architectures



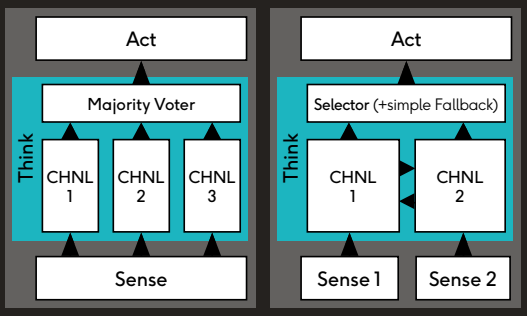
Such architectures are widely used in SAE Level 2 ADAS, but cannot satisfy the high availability requirements of the reference AD use case. They can still serve as a baseline for comparing more sophisticated architectures.



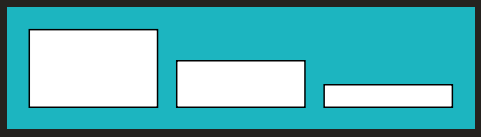
Symmetric architectures



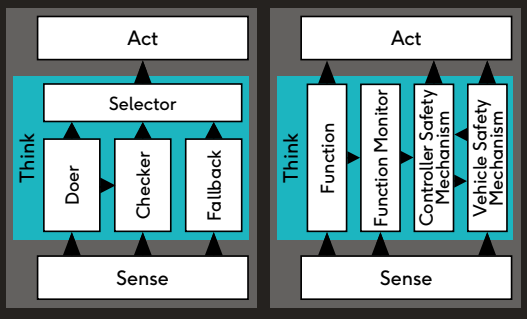
Such architectures rely on multiple channels providing the same or similar functions, often with some voting mechanic determining which output to use.



Asymmetric architectures



Such architectures employ asymmetric decompositions to reduce the complexity of some subsystems, e.g., by employing Doer/Checker or Active/Hot Stand-By approaches.

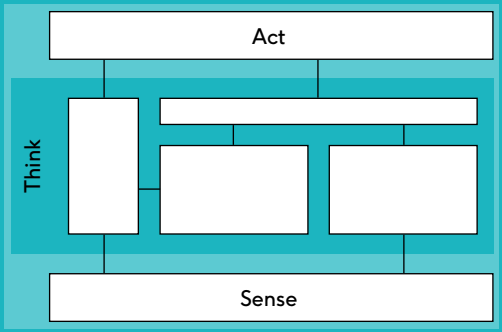


Apart from evaluating these architecture candidates against our defined criteria, we also intend to identify and extract the underlying principles. We invite other companies and research institutions to join us in this effort.

THE AUTONOMOUS
Working Group
Safety & Architecture

WHO WE ARE

BASELABS Data Fusion Results · CoreAVI Innovating a Safer Tomorrow · KTH Vetenskap och Konst · TTTechAuto · Infineon



WHAT WE DO (in a nutshell)

Our Working Group aims to identify high-level fail-operational system architectures suitable for safe self-driving cars (SAE Level 4 or higher).

JOIN OUR WORKING GROUP!

Become a member of The Autonomous Working Group Safety & Architecture – be part of the technical community working on global reference solutions for safe autonomous driving!

If you have any questions or want to speak directly with our team, you can get in touch with us at contact@the-autonomous.com.

WORKING GROUPS GOVERNANCE

The Governance of a Working Group encompasses the legal framework, rules, and mechanisms by which the Working Group operates, and its people are held to account. The roles within any Working Group include a Working Group Lead, the facilitator – The Autonomous – and the member companies. Each has different tasks, responsibilities, and opportunities within The Autonomous Working Group.

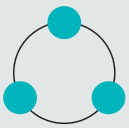
Facilitator	Working Group Members	Working Group Lead
The Autonomous	**Platinum, Gold, and Silver Members**	**Initiating company of the Working Group**
Responsibilities	**Responsibilities**	**Responsibilities**
✓ Neutral Position	✓ Financial contribution	✓ Neutral Position
✓ Organizational work	✓ Personal contribution	✓ Scope definition
✓ Onboards members	✓ Seat on the Expert Advisory Board available only for Platinum Members)	✓ Moderation
✓ Legal negotiations		✓ Coordination
✓ Facilitates meetings		✓ Chairperson for 1st period
✓ Coordinates units		

RULES OF PROCEDURE

Developed by The Autonomous, the Rules of Procedure deal with the following:

Governance

Voting rights



Attendance

Roles & responsibilities

The Rules of Procedure are accessible to all members or prospective members and give a comprehensive overview of what is required of each member (=company) and participant (=person).

If you are interested in learning more about the Rules of Procedure, roles and responsibilities of all participants in a Working Group:

DOWNLOAD DOCUMENT HERE

WORKING GROUP TESTIMONIALS

Udo Dannebaum

Lead Principal Engineer Automotive Applications, Infineon Technologies

"Collaboration in this field is needed because the development of safe automated driving is costly and time-consuming, but it does not give real differentiation-advantages to a single OEM."

Andreas Lauringer

CEO of Kontrol

"In our newly formed Working Group Safety & Regulation, we plan to collaborate with a diverse ecosystem of players on harmonizing regulatory frameworks and making legal texts accessible for engineers working on autonomous driving technology."

Marcus Obst

Head of Business Development, BASELABS

"The Working Group Safety & Architecture is a hotspot to meet smart people, discuss relevant topics and challenge each other."

Christian Mangold

Functional Safety Manager at TTTech Auto and member of the Working Group Safety & Architecture

"What lies ahead is very exciting. We have worked hard on the proposals, thoroughly analyzing and validating the input from the various stakeholders and external contributors to finally decide on a unified solution. We are one step closer to a reference solution and the realization of the car of the future."

TTTechAuto

Martin Törngren

Professor and Center Director, KTH Royal Institute of Technology

"The challenges of automated driving require industrial and multidisciplinary collaboration. The gathering of experts in The Autonomous Working Groups makes the initiative very interesting. There is a need to develop guidelines that move faster than (and go beyond) standards, contributing to methodological progress while promoting safety. Here, KTH wants to contribute with its experiences in systems architectures and multidisciplinary collaboration."

KTH VETENSKAP OCH KONST

Ask the Expert Podcast

WE LAUNCHED OUR OWN PODCAST!

Ask the Expert is a podcast series by The Autonomous in collaboration with a broad network of companies and institutions in the autonomous vehicle space.
Together with our guests, we tackled some of the most frequently asked questions on the future of safe autonomous mobility and covered honest conversations with well-known experts and decision-makers.

Follow us:

THE | AUTONOMOUS

EP 1
GAIL GOTTEHRER
ATTORNEY @ LAW OFFICE OF GAIL GOTTEHRER LLC

Ask the Expert

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EP 2
CHRISTOFER LAURELL
SENIOR VP RESEARCH & PUBLIC AFFAIRS @ EINRIDE

Ask the Expert

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EP 3
BENEDIKT WOLFERS
FOUNDING PARTNER @ PSWP

Ask the Expert

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EP 4
ERIC SCHMIDT
DIRECTOR LEAD ENGINEERING & SAFETY @ TTTECH AUTO

Ask the Expert

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EP 5
PHIL KOOPMAN
ASSOCIATE PROFESSOR @ CARNEGIE MELLON UNIVERSITY

Ask the Expert

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EP 6
MIKE POTTS
CEO @ STREETDRONE

Ask the Expert

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EP 7
THOMAS SCHNEID & JÜRGEN SCHÄFER
@ Infineon

Ask the Expert

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EP 8
INDU VIJAYAN
DIRECTOR OF PRODUCT MANAGEMENT @ AEye

Ask the Expert

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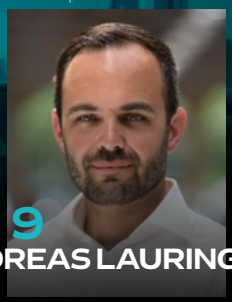

EP 9
ANDREAS LAURINGER
CEO @ Kontrol

Ask the Expert

PLAY NOW

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Our Key Successes

2000+
NEWSLETTER SUBSCRIBERS

1000+
DOWNLOADS OF TECHNICAL REPORTS

5000+
LINKEDIN FOLLOWERS

200+
NUMBER OF TIMES MENTIONED IN THE PRESS

20+
NUMBERS OF INTERVIEWS

THE AUTONOMOUS IN THE MEDIA SPOTLIGHT

electronic specifier

"WE NEED TO HAVE REDUNDANCY" – AV EXPERTS DISCUSSED SAFE LEVEL 4 SYSTEMS

"On a dedicated panel, participants from Audi, Infineon, TTTech Auto, AEye and Carnegie Mellon University discussed how to make SAE Level 4 systems safe, what is holding the industry back and how to advance safe autonomous vehicles (AVs)."

> SEE FULL ARTICLE

brutkasten

AUTONOME MOBILITÄT: "WIR MÜSSEN SCHNELL UND EFFIZIENT SCHEITERN"

"The time is now." Mit diesen Worten hat Ricky Hudi, Chairman von The Autonomous, das gleichnamige Event am 27. September in der Wiener Hofburg eröffnet. Das Ziel der Veranstaltung: Eine sichere Zukunft autonomen Fahrens zu gestalten und konkrete Maßnahmen zu setzen, um eine Mobilitätsrevolution voranzutreiben. "

> SEE FULL ARTICLE

SAE INTERNATIONAL

HOPEFUL BUT CLOSER SCRUTINY FOR SAE LEVEL 4 AUTOMATION

The Autonomous initiative's flagship conference pinpoints safety and collaboration to advance high-level vehicle automation. Representatives of some 200 companies convened to discuss Level 4 aspects such as genuine first-use cases, the role of artificial intelligence and how to guarantee Level 4 system safety.

> SEE FULL ARTICLE

EEWeb

ACT TO IMPACT: MAKING SAFE AUTONOMOUS MOBILITY A REALITY

"More than 500 global industry leaders and experts from companies including Aptiv, Audi, BMW, Bosch, Infineon, NVIDIA, Mercedes, Mobileye, Volvo, and Amazon Web Services, recently joined The Autonomous' flagship Main Event in Vienna and online.

> SEE FULL ARTICLE

T_HQ technology and business

AUTONOMOUS VEHICLES NAVIGATE MARKET PROSPECTS

Back in 2021, Bloomberg wrote that 'Self-Driving's Trough of Disillusionment Continues'. But tuning into The Autonomous Main Event 2022, the mood feels more buoyant with plenty of signals that autonomous vehicles are self-driving their way up the 'slope of enlightenment'.

> SEE FULL ARTICLE

THE OJO-YOSHIDA REPORT Technology in Context

CAN AI IN AVS GO BEYOND ‚PERCEPTION'?

Infineon is therefore eager to build "common understanding" among stakeholders. The company came to The Autonomous, to share its hypothesis, collaborate with key players and lead a working group discussion on the Safety of Embedded Artificial Intelligence.

> SEE FULL ARTICLE

Our Team

Philip Schreiner
Head of The Autonomous

As Head of The Autonomous, Philip Schreiner is strongly engaged in partnership management, building together with his team a rapidly growing ecosystem around autonomous mobility. In his role, he is also responsible for the overall project implementation, preparing the ground for the various stakeholders to create a common understanding of global safety in autonomous driving.

Luisa Griesmayer
Project & Events Manager

Wearing many different hats, Luisa brings direction to all projects within The Autonomous ecosystem. She plans, executes and monitors all initiatives and activities, keeping an eye on scope, budget, and timelines. Luisa rejoices in creating the right environment and events for The Autonomous community to meet, network and exchange on the future of safe autonomous mobility.

Iulia Juchert
Marketing Manager

A passionate marketing strategist, Iulia Juchert is responsible for shaping The Autonomous' brand identity, leveraging a variety of communication and marketing channels to connect with the expert community, partners and media. From social media, newsletters and websites to press, event and brand campaigns, she strives to bring creative, new ideas to ensure a positive experience of all stakeholders involved.

Eloïse Morel
Project & Events Manager

Passionate about delivering unforgettable in-person, virtual, and hybrid community gatherings, Eloïse oversees all The Autonomous events and ensures everything runs smoothly. With exceptional organizational skills and a knack for problem-solving, she coordinates all staff, plans the events from start to finish, prepares budgets, and analyzes the success of The Autonomous events.

Mariia Krupenko
Marketing Intern

Mariia is an organizational wizard who assists The Autonomous team on marketing and event-related projects and actively participates in communication brainstorming sessions. With an excellent eye for design, she supports the planning and execution of various marketing campaigns, but also the creation of written, video, and image content for The Autonomous channels.

Christoph Schulze
Technology Manager

Eager to pave the way towards Global Reference Solutions for safe autonomous mobility, Christoph Schulze seeks to establish and maintain a global network of technical experts in the field. A technology expert himself, Christoph holds a Ph.D. in Scientific Computing and Modeling from the Technical University of Vienna. Excited about the challenges of autonomous driving both on the system and application level, he is responsible for our Innovation Stream, particularly, the technical outcome of The Autonomous Working Groups.

FINANCIALS

EXPENSES	**€ 865.000,00**
Overhead Wages, office, material, infrastructure	€ 400.000,00
Event Stream Main Event, Chapter Events	€ 365.000,00
Innovation Stream Working Groups, tooling, promotion	€ 20.000,00
Marketing & PR	€ 15.000,00
INCOME	**€ 288.000,00**
Membership and Sponsorship	€ 220.000
Ticket Sales Main Event	€ 68.000

Join our community!

You are not yet part of The Autonomous? Get involved: Contact us!

Become a member

Will you join us in changing the way the mobility industry solves problems?

START NOW

Co-host a Chapter Event

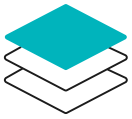
Connect leading experts around the world and allow cross-industry dialogue.

START NOW

Sponsorship

Position your brand at the heart of the autonomous mobility industry.

START NOW



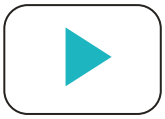
Content Packages

Collaborate with us to create relevant content for the autonomous mobility community.

START NOW

THE | AUTONOMOUS

The Autonomous
Operngasse 17-21 | 1040 Vienna | Austria
contact@the-autonomous.com
www.the-autonomous.com



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DON'T MISS OUT

Let's chat

How can we help you?

CONTACT US NOW