2021 IEEE SA ETHERNET & IP @ AUTOMOTIVE TECHNOLOGY DAY

3-4 November 2021 | Hybrid

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2021 IEEE SA ETHERNET & IP @ AUTOMOTIVE TECHNOLOGY DAY

Welcome to the 2021 Ethernet & IP @ Automotive Technology Day

In November 2011, BMW hosted the first Ethernet & IP @ Automotive Technology Day in Munich, Germany. In 2011, Ethernet in Automotive was at its very beginning. BMW was the only car manufacturer that had, only a few years earlier in 2008, launched the first car with Ethernet communication links using 2-pair 100BASE-TX for this purpose. At the time, BMW seemed to be the only car manufacturer seriously looking into Ethernet communication in the car.

However, single-pair BroadR-Reach (now 100BASE-T1) had just appeared on the scene, while the requirements for higher data rates started to appear industry-wide. Everyone was curious. Does it really work to transmit 100 Mbps data over one pair of unshielded cables under the severe electromagnetic conditions in cars? Who else is interested in this technology? What about timing requirements in best-effort Ethernet technology? The first Ethernet & IP @ Automotive Technology Day in 2011 sold out with more than 300 participants!

Since then Automotive Ethernet has come far. All major car manufacturers have introduced Automotive Ethernet into their EE-architectures. Various new physical-layer technologies have been specified (from 10 Mbps to 10 Gbps over electrical and partially also optical media), new protocols have been created to meet even more stringent timing requirements, and tool vendors and test houses have outdone themselves to support the development process with respective products. All the while, Ethernet & IP @ Automotive Technology Day has toured the world and established itself as one of the main events for information exchange on the latest trends on Automotive Ethernet.

This year, 2021, we are back in Munich! Owing to the ongoing COVID-19 pandemic, not to full capacity for the in-person event, but nevertheless in person. In order to also allow those still facing travel restrictions to partici-pate, we are again exploring new paths by holding a hybrid event. We have in-person attendance with live pre-sentations, exhibits, and an evening social activity. In addition, the event is being streamed via its online plat-form. Participants on the virtual platform can follow the live event, including participation in the Q&A session by posting questions to the respective chat. A live tour of the onsite booths allows virtual participants to learn about the exhibits at the event as well. Those participating from different time zones can access the recorded presentations at a time of their convenience.

As the initiator of the event and this year's chair and moderator, I am particularly looking forward to wel-coming you all to the 11th Ethernet & IP @ Automotive Technology Day on 3-4 November 2021. As this is the delayed anniversary event, we accommodate this with a special keynote delivered by the chairs of the previous events.

Kirsten Matheus, BMW, 2021 IEEE SA EIP@ATD Chair

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CONFERENCE COMMITTEES

CONFERENCE STEERING COMMITTEE

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Daniel Hopf – Continental Automotive (Vice Chair)
Yasuhiro Kotani (Denso) – JASPAR
Jonathan Kuhn – Fiat Chrysler
Chris Mash – Ethernovia (PC Vice Chair)
James Lawlis – Ford Motor Company
Damon Martini – Robert Bosch
Rudi Schubert – IEEE SA
Soheil Samii – Motional (PC Chair)
Josetxo Villanueva – Renault
Jinhwa Yun – Hyundai Motor Company

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James Lawlis – Ford Motor Company
Laurent Manhes – Microchip
Damon Martini – Robert Bosch
Kirsten Matheus – BMW
Don Pannell – NXP
John Simon – Intrepid Control Systems
David Stiles – Stellantis
Prathap Venugopal – General Motors
Josetxo Villanueva – Renault
Michael Ziehensack (Elektrobit) – Continental Automotive

CONFERENCE AGENDA

WEDNESDAY, 3 NOVEMBER 2021	
9:00 -9:30 CET	*Opening: Master of Ceremonies* *Rudi Schubert - (IEEE Standards Association)* *Welcome Speech – Graham Smethurst (BMW Group)*
SECURITY	
9:30 – 10:00 CET	**Automotive MACsec Architecture** Oliver Creighton, Tobias Hauber, BMW Group Lars Völker, Technica Engineering GmbH
SERVICE-ORIENTED ARCHITECTURE	
10:00 - 10:30 CET	**Communication Management in Automotive Service-Oriented Architectures** Trista Lin, David Fernandez Blanco, Juleixis Guariguata Stellantis
10:30 – 11:00 CET	**COFFEE BREAK**
11:00 -11:30 CET	**Time-Sensitive and Mixed-Critical Control Data Streams in Service-Oriented Architecture Based on Automotive Ethernet** *Thomas Galla, Michael Ziehensack* *Elektrobit*
QUALITY OF SERVICE/TSN	
11:30 – 12:00 CET	**How to Achieve Redundant Time Synchronization Using 802.1AS-2020 Features for Sensor Fusion and Autonomous Driving Scenarios** *Razvan Petre* *Spirent*
12:00-12:30	Presenting the Exhibitors in the Conference Zone: Broadcom, Corning, Microchip, Rohde & Schwarz, Technica Engineering
12:30 – 14:00 CET	**LUNCH**

CONFERENCE AGENDA

14:00 – 14:30 CET	**The Challenges and Solutions of Mixed Data Rate Ethernet Networks** *Manfred Kunz* *Don Pannell* *NXP Semiconductors*
14:30 – 15:00 CET	**Arbitrating the Fight between 802.1Q TSN Shapers** *Max Turner, Ethernovia* *Anna Engelmann, VW CARIAD* *Jean Walrand, UC Berkeley*
15:00 – 15:30 CET	**COFFEE BREAK**
15:30 -16:00 CET	**Use of TSN for Wheel Sensor Data in a Zonal Architecture** *Shrikant Acharya, Excelfore* *Martin Bornemann, Aptiv*
16:00 – 16:30 CET	**The "Free Rider Principle" for Low-Bandwidth Flows in High Line-Rate Networks** *Max Turner, Ethernovia* *Jean Walrand, UC Berkeley*
16:30 – 17:00 CET	**BREAK**
	EXHIBITOR PRESENTATIONS
17:00	**Presenting the Exhibitors in the Studio**: BMW, Granite River Labs, Intrepid Control Systems, KDPOF, NXP, Renesas, Ruetz Systems, Siemens, TSN Systems, Vector Informatik, ViGEM

NETWORKING DINNER
19:00 – 20:30 CET
Bldg. 110.1

Meet outside Projekthaus Studio
First Group: 18:30
Second Group: 18:45

CONFERENCE AGENDA

THURSDAY 4 NOVEMBER 2021	
9:00 -9:30 CET	*Keynote: The next 10 years.* *Hosts of previous Ethernet & IP @ Automotive Technology Days*
PHYSICAL LAYER	
9:30 – 10:00 CET	**The 10BASE-T1S OA-3p Interface -Enabling Advantages for the All-Ethernet Vehicle** *Martin Miller* *Microchip Technology*
10:00 – 10:30 CET	**ESD Protection for Automotive Ethernet Applications** *Lukas Droemer, Andreas Hardock* *Nexperia*
10:30 – 11:00 CET	**COFFEE BREAK**
11:00 – 11:30 CET	**Technical Feasibility of Glass Optical Fibers for Automotive Ethernet** G. Mabud Choudhury (OFS), John S. Abbott (Corning Inc.), John Earnhardt (OFS), Masato Shiino (Furukawa Electric Co. Ltd)
11:30 – 12:00 CET	**Does Cable Shielding Prevent all EMC Challenges?** *Jamila Josip Borda and Michael Kaindl* *BMW Group*
12:00 – 12:30 CET	**Testing PAM4 Signaling for 10GBASE-T1 Automotive Ethernet** *Curtis Donahue* *Rohde & Schwarz*
12:30 - 14:00 CET	**LUNCH**
SWITCHES AND CONFIGURATION	
14:00-14:30 CET	**Status Quo of Dynamic Network Management with YANG-Based Configuration Models** *Christian Herber* *NXP Semiconductors*
14:30 – 15:00 CET	**Smart Switches in AUTOSAR Eco Systems: Roles and Software Architecture** *Markus Helmling* *Vector Informatik GmbH*

CONFERENCE AGENDA

15:00 – 15:30 CET	COFFEE BREAK
ARCHITECTURE AND DIAGNOSTICS	
15:30-16:00 CET	**Reimagining Vehicular Communication using Programmable Data Plane Technologies** *Naresh Nayak, Sebastian Schildt and, Dennis Grewe* *Robert Bosch GmbH*
16:00-16:30 CET	**Analysis of a low-cost gigabit diagnostic interface** *Thomas Königseder* *Technica Engineering GmbH*
16:30 CET	**Closing Remarks**
	Additional Presentation: **What is the conqueror in the SOA platform for the future in-vehicle networks? - A study based on JASPAR's automotive use cases** **Takumi Nomura (Honda), Akizuki Katsuyuki (NEC), Yoshihiro Ito (Nagoya Institute of Technology), Taichi Itagawa (Denso), Takao Hasegawa (Aubass), Tatsuya Izumi (Sumitomo Electric), Yoshiyasu Watanabe (Toyo Corporation), Hideki Goto (Toyota), Yasuhiro Kotani (Denso**

ARCHITECTURE AND DIAGNOSTICS	SERVICE-ORIENTED ARCHITECTURE
PHYSICAL LAYER	SECURITY
QUALITY OF SERVICE/TSN	SWITCHES AND CONFIGURATION

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For more information, visit:
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EXHIBITORS

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Booth Number: #11
Company Name: **The BMW Group**
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Title: Senior Expert
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Phone: 49 89 382 12635

With its four brands BMW, MINI, Rolls–Royce and BMW Motorrad, the BMW Group is the world's leading premium manufacturer of automobiles and motorcycles and provides premium financial and mobility services. The BMW Group production network comprises 31 production and assembly facilities in 15 countries; the company has a global sales network in more than 140 countries.

In 2020, the BMW Group sold more than 2.3 million passenger vehicles and more than 169,000 motorcycles worldwide. The profit before tax in the financial year 2020 was € 5.222 billion on revenues amounting to € 98.990 billion. As of 31 December 2020, the BMW Group had a workforce of 120,726 employees.

The success of the BMW Group has always been based on long-term thinking and responsible action. The company set the course for the future at an early stage and consistently makes sustainability and efficient resource management central to its strategic direction, from the supply chain through production to the end of the use phase of all products.

BRONZE SPONSOR

Booth Number: Room 17VC on 3 November/
                     Room 16 on 4 November/
Company Name: **Broadcom**
Company Address: 1320 Ridder Park Drive
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Company Contact:
Title:
Email:
Phone: 408-433-8000

Broadcom designs, develops and supplies a broad range of semiconductor and infrastructure software solutions. Broadcom's category-leading product portfolio serves critical markets including data center, networking, software, broadband, wireless, storage, industrial and automotive.

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Booth Number: Room 13, First Floor
Company Name: **Corning Incorporated**
Company Address: 1 Riverfront Plaza
City/ State/Country: Corning, NY 14830, USA
Website: http://www.corning.com
Company Contact: Suresh Donthu
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Email: donthus@corning.com
Phone: (607) 974-5044

Corning is one of the world's leading innovators in materials science, with a 170-year track record of life-changing inventions. Corning applies its unparalleled expertise in glass science, ceramic science, and optical physics along with its deep manufacturing and engineering capabilities to develop category-defining products that transform industries and enhance people's lives. Corning succeeds through sustained investment in RD&E, a unique combination of material and process innovation, and deep, trust-based relationships with customers who are global leaders in their industries. Corning's capabilities are versatile and synergistic, which allows the company to evolve to meet changing market needs, while also helping our customers capture new opportunities in dynamic industries. Today, Corning's markets include optical communications, mobile consumer electronics, display, automotive, and life sciences. In automotive, Corning is helping drive the trend toward cleaner, safer, and more connected vehicles. Building on five decades of leadership in clean-air technologies, Corning continually innovates its advanced cellular ceramic substrates and ceramic particulate filters for gasoline and diesel emissions control, helping customers meet new emissions standards and enable cleaner air worldwide. Corning is also enhancing vehicle exteriors and interiors with technical glass innovations that can enable sophisticated in-vehicle display designs, lightweight, damage-resistant windows, and enhanced connectivity.

BRONZE SPONSOR

Booth Number: #3
Company Name: **Granite River Labs (GRL)**
Company Address: 3500 Thomas Road, Suite A
City/ State/Country: Santa Clara, CA 95054, USA
Website: https://graniteriverlabs.com/
Company Contact: Brissa Ortega
Title: Marketing Coordinator
Email: bortega@graniteriverlabs.com
Phone: (408) 471-7389

Granite River Labs (GRL) helps engineers solve the toughest design and validation challenges. Since 2010, our affordable end-to-end testing, certification, and compliance services and related proprietary instrumentation and software solutions have enabled hardware developers worldwide to implement digital interfaces and charging technologies as they become faster, more complex, and more challenging to test. A combination of market-leading technical expertise, broad capabilities, and an intense focus on quality and customer service excellence has seen the company grow rapidly and win recognition as the "go-to" expert.

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EXHIBITORS (Continued)

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Booth Number:	#6
Company Name:	**Intrepid Control Systems GmbH**
Company Address:	Haid-und-Neu-Str. 7
City/ State/Country:	76131 Karlsruhe, Germany
Website:	www.intrepidcs.com
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Intrepid Control Systems (www.intrepidcs.com) has been thriving for more than 25 years, producing advanced hardware and software tools for engineers in vehicle autonomy, connectivity, automotive Ethernet, and embedded engineering. Intrepid also produces industry-leading devices for 10GBASE-T, 1000BASE-T1 and 100BASE-T1 and supports the latest networks and protocols, including AUTOSAR, CAN FD, CAN, LIN, FlexRay, Automotive Ethernet, IoT, SerDes, AVB/TSN, A²B, J1939, and ISO 14229. Intrepid's customers include many global automakers and major Tier 1 suppliers working on autonomous and connected vehicles. Headquartered in metro Detroit, Intrepid has offices in the United States, China, Japan, the United Kingdom, Germany, India, Korea, and Australia for direct sales and customer support.

BRONZE SPONSOR

Booth Number:	#7
Company Name:	**KDPOF, Knowledge Development for POF, S.L.**
Company Address:	Ronda de Poniente, 14 2º C-D, 28760 Tres Cantos
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Booth Number:	Room 11, First Floor
Company Name:	**Microchip Ltd.**
Company Address:	Microchip House, 720 Wharfedale Road, Winnersh Triangle
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GOLD SPONSOR

Booth Number:	#5
Company Name:	**NXP Semiconductors**
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NXP Semiconductors N.V. enables secure connections for a smarter world, advancing solutions that make lives easier, better, and safer. As the world leader in secure connectivity solutions for embedded applications, NXP is driving innovation in the automotive, industrial & IoT, mobile, and communication infrastructure markets. Built on more than 60 years of combined experience and expertise, the company has approximately 29,000 employees in more than 30 countries.

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Booth Number:	#9
Company Name:	**Renesas Electronics Europe GmbH**
Company Address:	Arcadia Strasse 10
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Renesas Electronics Corporation (TSE: 6723) delivers trusted embedded design innovation with complete semiconductor solutions that enable billions of connected, intelligent devices to enhance the way people work and live. Renesas is built on a strong historical foundation of technological innovation originating from Hitachi, Mitsubishi, and NEC. Fueled by the Intersil, IDT, and Dialog integrations, Renesas is now poised to extend its share in fast-growing data economy-related markets such as infrastructure and data center, and strengthen its presence in the industrial and automotive segments.

Our mission is to develop a safer, healthier, greener, and smarter world by providing intelligence to our four focus growth segments: automotive, industrial, infrastructure, and IoT that are all vital to our daily lives, meaning our products and solutions are embedded everywhere.

A global leader in microcontrollers, analog, power, and SoC products, Renesas provides comprehensive solutions for a broad range of automotive, industrial, Infrastructure, and IoT applications that help shape a limitless future. Learn more at renesas.com.

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for adding their local legal disclaimer specifying all required technical details.

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Booth Number:	Room 12, First Floor
Company Name:	**Rohde & Schwarz**
Company Address:	Muehldorfstrasse 15
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Title:	
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As a leading worldwide provider of test and measurement solutions, Rohde & Schwarz develops innovative products for the entire automotive lifecycle. OEMs, Tier 1s, and chip suppliers rely on test solutions for automotive radar, connectivity, infotainment, high-performance computing, and EMC compliance. With solutions for radar tests, Rohde & Schwarz supports its customers for the launch of next-generation ADAS and AD systems. The company ensures robust connectivity conforming to all standards from 5G and C-V2X to UWB, Wi-Fi 6, and GNSS. Rohde & Schwarz instruments enable the development and debugging of in-vehicle networks with modern bus speeds as well as ECUs such as high-performance domain controllers, and help to eliminate EMC issues. Rohde & Schwarz also offers custom turnkey test systems for carrying out EMI and EMS measurements in line with all major CISPR and manufacturer-specific EMC standards. This equipment supports full vehicle antenna and wireless coexistence testing with the user's own systems and instruments.

Furthermore, the company provides solutions for the component and board level during ECU production. Partners and customers use these test solutions to ensure automotive components and systems function correctly, interact flawlessly, and communicate faultlessly with the outside world.

BRONZE SPONSOR

Booth Number:	#8
Company Name:	**Ruetz System Solutions GmbH**
Company Address:	Oskar-Schlemmer-Straße 13
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In automotive data communication the development of automotive technologies requires precisely aligned processes and workflows. For this, Ruetz System Solutions puts our proven special knowledge and our structured processes at the disposal of carmakers and suppliers. Through our experience as a test partner, project managers obtain the clear, unbiased perception of an independent test house. As such, it is possible to objectively assess the maturity of a development at each design stage, and consequently to reach a smooth and punctual production start.

RUETZ SYSTEM SOLUTIONS is a competent partner in the definition and validation of Ethernet solutions. Special attention rests on the assessment of migrating the standard of carrier systems into the automotive world.

Our service portfolio includes training for automotive Ethernet and the design of architecture and system specifications. We provide support for the development of Ethernet, AVB, TSN, and TCP-IP software as well as for the design of hardware for different physical layers. Furthermore, we offer a broad service spectrum ranging from requirements engineering over test specifications and the design of test setups to the implementation of unit, system integration, application, and compliance testing.

GOLD SPONSOR

Booth Number:	#10
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Siemens Digital Industries Software is driving transformation to enable a digital enterprise where engineering, manufacturing, and electronics design meet tomorrow. The Xcelerator portfolio helps companies of all sizes create and leverage digital twins that provide organizations with new insights, opportunities, and levels of automation to drive innovation. For more information on Siemens Digital Industries Software products and services, visit www.sw.siemens.com or follow us on LinkedIn, Twitter, Facebook, and Instagram. Siemens Digital Industries Software—Where today meets tomorrow.

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Bringing Ethernet to the automotive industry since 2008, Technica is a trusted engineering and testing partner for the leading OEMs and tier 1s in the field. Mastering automotive networks like no one else, Technica has been developing in-vehicle Ethernet solutions, guiding customers through the entire product creation process. Its innovative automotive ethernet hardware and software solutions and services allow customers to test modern onboard electronic components and networks extensively and efficiently. First to develop MediaConverter products on the market for both 100BASE-T1 and 1000BASE-T1, they also introduced the following

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solutions to their portfolio: Media Gateway, SFP Modules, and Capture Modules for In-Vehicle Network for different bus systems, such as CAN/CAN-FD, LIN, Ethernet, 100BASE-T1, and 1000BASE-T1—supporting time synchronization and Technically Enhanced Capture Module Protocol (TECMP). Moreover, in 2021, they have launched a new generation of Media Gateway: the Enhanced Ethernet Switch—available in three variants (H-MTD, MATEnet, and RJ-45) with AVB features. Using a holistic approach when analyzing the automotive network, Technica provides the ideal testing equipment combination: Hardware products, the software tool ANDi (Automotive Network Diagnoser), joined by System Engineering expertise, will help you drive your Ethernet project to the next level. For more information, please visit us: https://technica-engineering.de.

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Time matters. TSN Systems is the expert in time sensitive networking for automotive, industrial, and AV applications. Since 2008 we have been providing holistic measurement and analysis tools for deterministic systems that are always reliable.

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Booth Number: #4
Company Name: **Vector Informatik GmbH**
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For more than 30 years, Vector has been your competent partner for the development of automotive electronics. Driven by our passion for technology, we develop solutions that help engineers to manage their demanding tasks. At 31 locations in 16 countries, more than 3000 Vectorians support manufacturers and suppliers of the automotive industry and related industries with professional solutions.

Automotive Ethernet Product Portfolio
Customers benefit from Vector's products for Automotive Ethernet that support the vehicle-specific physical layers as well as protocols like SOME/IP, SD, AVB/TSN, DoIP, Smart Charge Communication, etc.

Advantages:
• Model-based development of network architectures, communication descriptions, and software design
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• Interfaces for direct access to Ethernet networks
• Embedded software with low resource requirements to meet the challenges in the automotive industry
• Universal ECUs for small series and functional models
• Training on Ethernet technologies in the automotive environment

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Booth Number: #2
Company Name: **ViGEM GmbH**
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Company Contact: Peter Blume
Title: Head of Sales and Marketing
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Phone: 49 (0)721.90990.549

The German electronic expert ViGEM sets new standards in automotive measurement for the development, validation, and qualification of ADAS and autonomous driving. ViGEM provides mobile, high-performance Car Communication Analyzer (CCA) solutions consisting of high-speed data loggers, robust removable data storage modules, and fast copy stations. The CCA 9010 solution features continuous data rates of up to 25 Gbit/s, data storage capacities of up to 64 TB, and transmission speeds of up to 50 Gbit/s.
External Capture Units take up sensor/ECU data near the source and communicate the captured data via Ethernet to the data logger. More than 40 interfaces, e.g., 10G Ethernet, 1000Base-T, 100Base-T1 Ethernet, and CAN FD enable the connection of almost all available sensor and camera systems to the CCA 9010 as well as the seamless integration with external units. The synchronized timestamp gPTP guarantees the simultaneous recording of all bus systems. Multiplication of the performance is possible by cascading several loggers.

ViGEM´s sophisticated mobile data handling allows the quick exchange of the removable data storage and fast data transfer to the data center. Thus, customers benefit from extremely short downtimes and a time and cost-efficient utilization of their test vehicles.

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SPEAKERS (Alphabetical by last name)

John S. Abbott

John S. Abbott is a Development Fellow at Corning Incorporated. He contributes to IEEE 802.3 Ethernet. He is an associate editor of *IEEE/OSA Journal of Lightwave Technology,* a member of the editorial board for the journal *IET Optoelectronics*, and has co-authored two book chapters on multimode fiber for data centers. He has worked at Corning for more than 40 years and has numerous patents related to optical fibers in areas of product design, measurements, and manufacturing process, as well as the thin glass sheets used for displays in monitors and mobile devices. Dr. Abbott has a PhD in Applied Mathematics from Massachusetts Institute of Technology and a BS in Mathematics from Caltech.

Shrikant Acharya

Shrikant Acharya is CTO and co-founder of Excelfore, where he drives the company's technology roadmap and partnerships. He also serves on the board of the eSync Alliance. In addition to his work in cloud-to-vehicle communications, he has been an early advocate for Ethernet AVB/TSN in automotive applications, achieving the first AVNU-certified AVB talker and listener stacks in 2017. He received his MSEE from the University of Texas at Arlington and holds more than 20 patents.

Katsuyuki Akizuki

Katsuyuki Akizuki is a member of JASPAR Next Generation High-Speed Network Working Group and is also an Assistant Manager at NEC Communication Systems, Ltd.
He has worked on in-vehicle communication technologies including Audio/Video Bridging (AVB), Time-Sensitive Networking (TSN), Software Defined Networking (SDN), and Clock Extension Peripheral Interface (CXPI).
His current research interests lie in automotive Ethernet technologies and edge computing technologies.

Automotive Data Connectivity & Charging Testing

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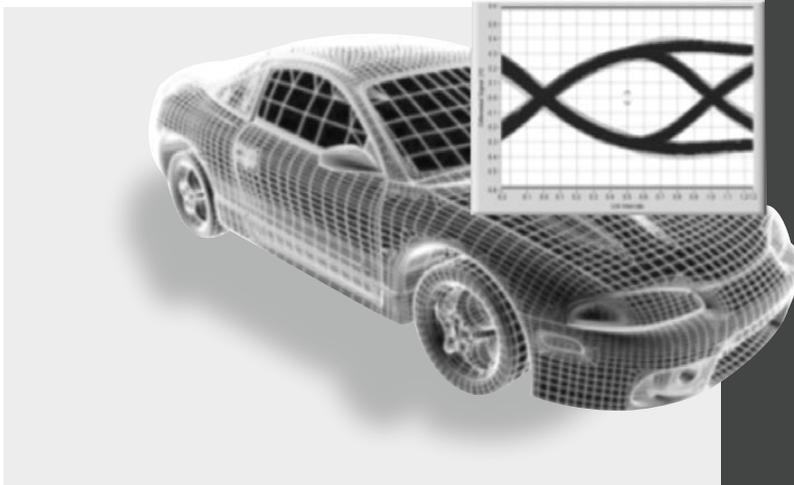
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solve tough validation challenges for Automotive Networking, Infotainment, Charging and Power Management.

DEEP STANDARDS EXPERTISE AND TESTING CAPABILITIES:

- Automotive Ethernet
  - ∟ 10 BASE/T1S
  - ∟ 10/100/1000BASE-TI
  - ∟ Multi-gigabit Ethernet
  - ∟ GigE over Plastic Optical Fiber (GEPOF)
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Jamila-Josip Borda

Jamila-Josip Borda is a hardware/electronic design and development engineer with several years of experience in high-speed & mixed signal communication electronic circuit and system design. She holds a BSc in Computer Science and Communications Engineering and earned her MSc in Electrical and Computer Engineering with specialization in Micro- and Nano-Electronic from the RWTH Aachen University in Germany.

She has extensive experience in HW design and development of Intel x86 and Freescale PowerPC electronic platforms for customized industrial panel PCs, machine/vehicle mounted displays/terminals and industrial firewalls/routers. She has also specialized in the state-of-the-art ADAS electronic system design covering design concept, architecture and test specification definition for different product development stages. Currently at BMW, Jamila focuses on pre-development and research topics of physical layer implementation for high-speed in-vehicle communication technologies and High-Performance Computing. At the ASA Alliance, Jamila currently serves as the technical committee (TC E) chair for EMC & Channel/Components test specifications. She is also the ASA-OPEN Alliance technical liaison officer from ASA's side.

Martin Bornemann

Martin Bornemann joined Aptiv more than 20 years ago. He has worked in several positions in innovation management, project management, and hardware development. He is currently responsible for the hardware and system aspects of the Aptiv Smart Vehicle Architecture (SVA) concept and is leading the advanced development for vehicle architecture, sensing components, and computer platforms. Before joining Aptiv, he designed telecom equipment for Ericsson and did WLAN research for Bosch.

G. Mabud Choudhury

G. Mabud Choudhury is Standards Manager for OFS. He contributes to IEEE 802.3 Ethernet, INCITS T11 Fibre Channel, and IEC Fibre standards. He is Vice Chair for IEEE P802.3db 100 Gb/s, 200 Gb/s, and 400 Gb/s Short Reach Fiber Task Force. Previously, he was R&D Engineer and Manager for product development, systems engineering and standards of copper, fiber and intelligent cabling infrastructure products/solutions for AT&T Bell Labs, Lucent, Avaya, and CommScope. Mr. Choudhury has an MS degree in Mechanical Engineering from Massachusetts Institute of Technology and a BS degree in Mechanical Engineering and in Chemistry from Duke University. He holds 32 U.S. patents. He has authored and presented papers and webinars discussing fiber solutions for IWCS, BISCI ICT, TIA FOTC, fiber systems, and cabling installation and maintenance.

SPEAKERS (Continued)

Oliver Creighton

Oliver Creighton is onboard network security architect in BMW's E/E Architecture and Automotive Security department. His areas of expertise include the onboard Ethernet architecture, variability model across BMW's entire product range, and several onboard network security mechanisms. Since mid-2020, he is the organizer of BMW's Center of Competence for Automotive Security.

Before joining BMW in 2016, he worked as Senior Software Engineer for "Olli," the all-electric autonomous shuttle vehicle from Local Motors. He held various positions during his time at Siemens from 2005 through 2015, e.g., developing a software-intensive system architecture for electric vehicles, but also in program management, consulting, training, and development of requirements engineering techniques. In this capacity he worked for several operating units within Siemens worldwide. He received his doctoral degree in computer science from Technische Universität München in 2005.

Curtis Donahue

Curtis Donahue is the Global Technology Manager for High Speed Digital Interfaces at Rohde & Schwarz. Curtis has more than ten years of experience in the test and measurement industry, focusing on physical layer test applications from 10 Mbps to 100 Gbps. Curtis actively participates in standards development organizations and special interest groups including IEEE 802.3, Ethernet Alliance, OPEN Alliance, and InfiniBand Trade Association. Curtis has edited and been a technical contributor for several IEEE 802.3 projects including IEEE 802.3ch (10GBASE-T1, 5GBASE-T1, 2.5GBASE-T1), IEEE 802.3cg (10BASE-T1L, 10BASE-T1S), IEEE 802.3bp (1000BASE-T1), and IEEE 802.3bw (100BASE-T1); as well authoring test specifications for OPEN Alliance TC1 (100BASE-T1) and TC12 (1000BASE-T1).

Lukas Droemer

Lukas Droemer joined Nexperia as a company sponsored BSc student for industrial engineering in 2014. Since April 2018, he has been the responsible product manager for Nexperia's automotive ESD protection and EMC portfolio, including the latest solutions for automotive in-vehicle networks such as OPEN Alliance Ethernet.
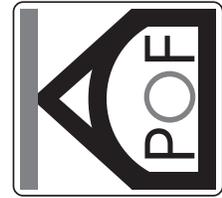
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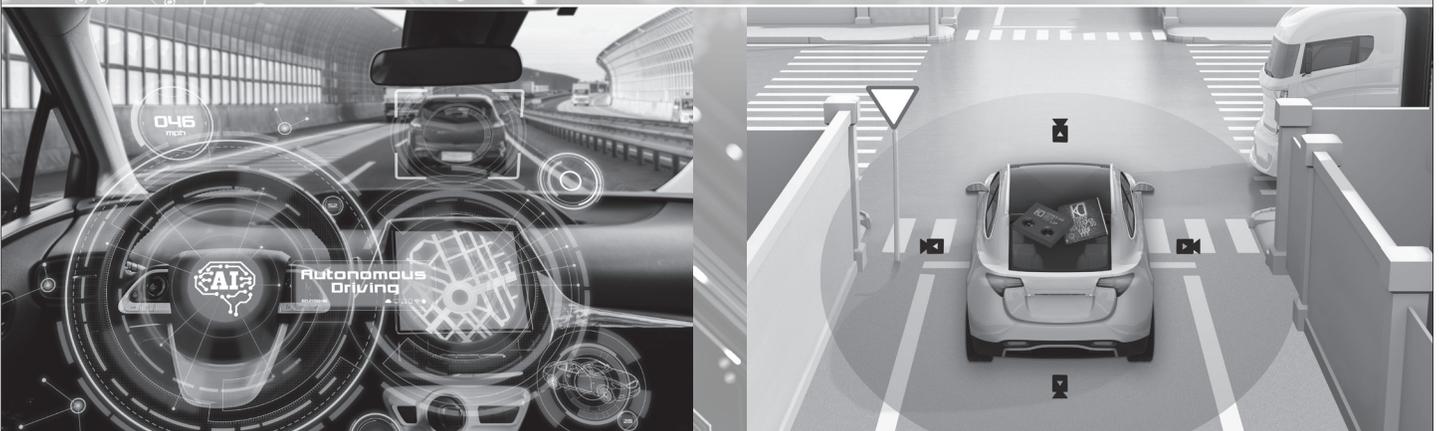
SPEAKERS (Continued)

Anna Engelmann

Anna Engelmann is a senior system development engineer at CARIAD SE in Wolfsburg, Germany. She received her MS. in Computer and Communications Systems engineering and doctoral degree in Electrical engineering from the Technical University Braunschweig, Germany. Her main research interests include the performance evaluation of communication networks and protocols and the design of reliable and time-sensitive network systems. She has actively contributed to multiple EU and German research projects and current IEEE 802.1 TSN draft standards.

David Fernandez Blanco

David Fernandez Blanco is a PhD student at the National Institute of Applied Sciences (INSA) Lyon and associated with STELLANTIS. He has an MSc degree in Telecommunications Engineering with a specialization in the Internet of Things and a three-year specialization in Research and Development over distributed systems and cloud computing at CITI Lab. His research interests lie in the development of the next generation E/E and software architectures.

Thomas M. Galla

Thomas M. Galla studied computer science at the Vienna University of Technology. He received the MSc degree (with distinction) in 1995 and the PhD degree (with distinction) in 2000. Thomas M. Galla is currently employed as chief expert at Elektobit Austria GmbH, Vienna, where he is responsible for the software architecture of Elektrobit's AUTOSAR communication stack. Thomas M. Galla has been involved in AUTOSAR since 2003 and represents Elektrobit in the AUTOSAR working group for in-vehicular communication (WG-IVC), and in the architectural sub-working group for multi-core and basic software distribution (WG-CP-MCBD).
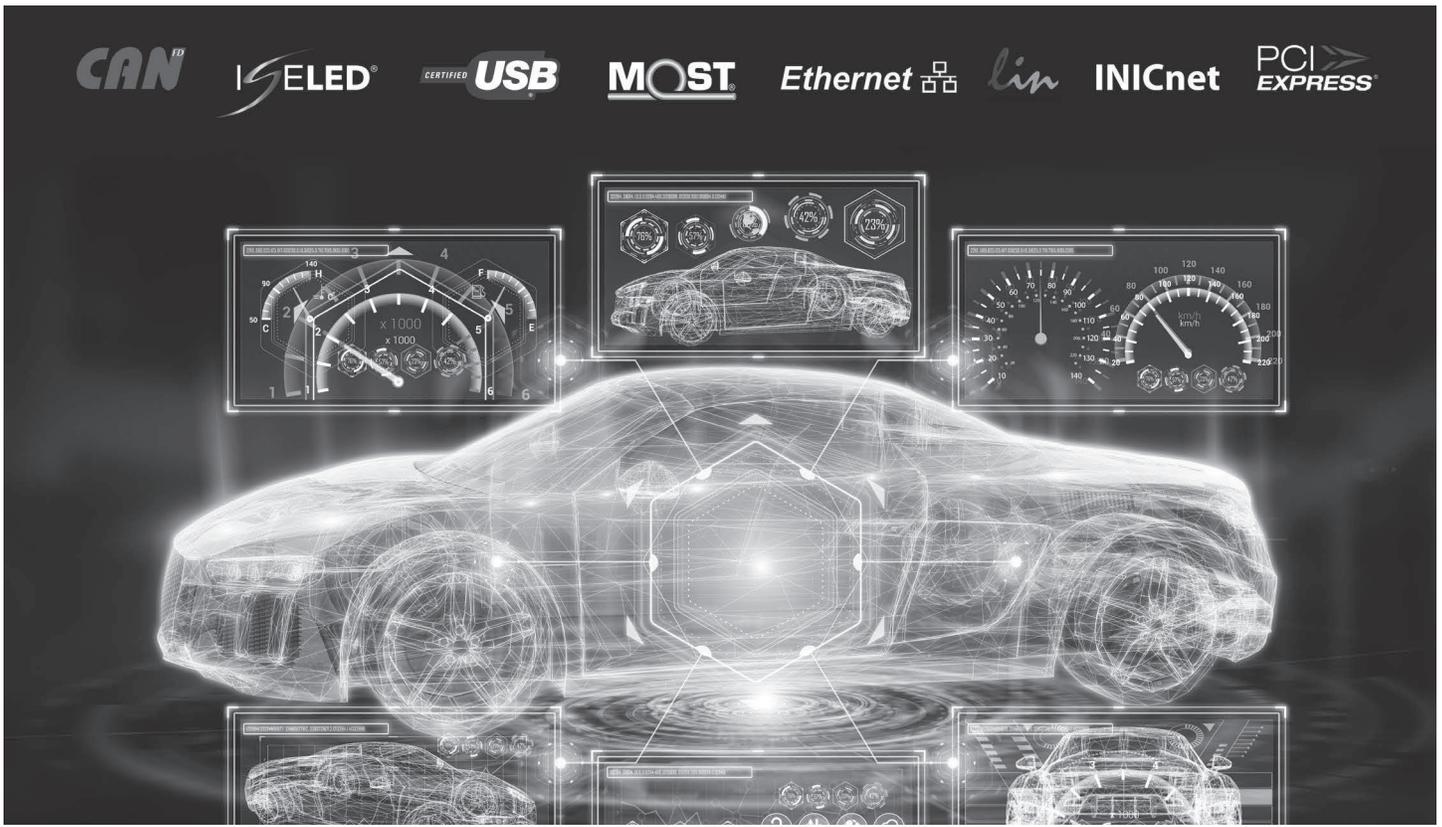
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SPEAKERS (Continued)

Dennis Grewe

Dennis Grewe (dennis.grewe@de.bosch.com) is a research engineer in the Bosch Research division at Robert Bosch GmbH. He received his BSc and his MSc in computer science (2015) from the University of Applied Science Stuttgart (HdM). His current research interests include network protocols and architectures to support service-oriented communication as well as computing on network infrastructures including principles from software-defined and data-oriented networks for connected vehicular systems.

Juleixis Guariguata

Juleixis Guariguata is a Connected Services architect in the E/E architecture design department at Stellantis. She is responsible for features allocations and deployment all over the architecture. Prior to Stellantis, she gained more than 10 years of telecom experience in wireless and IP network design and support. She holds a MSc degree in Network Design and IoT from IMT Atlantique (formely known as Telecom Bretagne), France, and a bachelor in System Engineering from UNEXPO, Venezuela. Her research interests lie in the next generations of E/E architectures, SW, and services.

Andreas Hardock

Andreas Hardock studied nanostructure technology at the Julius Maximilian University of Würzburg and earned his PhD in the field of functional bias at the Technical University of Hamburg-Harburg. He started his professional career in 2015 in the automotive sector as an EMC engineer at Behr-Hella Thermocontrol. From 2016 to 2020 he was at Continental Automotive GmbH in Babenhausen, where he was responsible for SI/PI and EMC and ESD topics in the role of hardware architect in product development. In 2020, he joined Nexperia as Application Marketing Manager with focus on ESD and EMC topics and products for the automotive market.

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Christian Herber

Christian Herber is a Principal Software Architect for Automotive Ethernet Solutions at NXP. In this role, he is responsible for the definition of Ethernet switch and PHY software including AVB/TSN stacks. He has a background in automotive networking and processors. He holds a PhD in Electrical Engineering and an MSc in Electrical Engineering and Information Technology, all from Technical University of Munich.

Michael Kaindl

Michael Kaindl studied Electronic Engineering at the OTH (University of Applied Science) in Regensburg, Germany. In 1984, he began his career at IBM Böblingen in the development of high-speed printers. Then, in 1988, he worked on the development of digital audio equipment at Dynacord. Since 1990, he has worked on the HW and SW development of ECU for chassis electronics at BMW. He has been involved in the development and application of automotive communication busses like the BMW K-Bus and P-Bus, LIN, CAN, FlexRay, Ethernet, and SerDes. He has also been involved in developing standards around these network technologies since 2000. His current focus is the series introduction of 1000BASE-T1 and preparation of Multi Gigabit BASE-T1 for future car projects. He works actively in Open Alliance technical workgroups (e.g., TC9 and TC12) and on the standardization of SerDes. He contributed to the MIPI-PHY until 2019 and currently works on standardization of the physical layer and test with the ASA. Within the work on EMC and the required shielded or coax cable, the importance of a clear understanding rise attraction in order to have successful operation of high-speed communication technologies.

Thomas Königseder

Thomas Königseder studied telematics at the Graz University of Technology in Austria. He worked 18 years for BMW. As head of communications technology at BMW, Thomas Königseder was responsible for introducing Ethernet for Automotive and is one of the key persons for the Automotive Ethernet movement. Together with his co-author Dr. Kirsten Matheus, he wrote a book for the introduction of Automotive Ethernet which was published by Cambridge University Press Since 2017, Thomas Konigseder has served as CEO and CTO of Technica Engineering where he has evolved the company from testing to a technology consulting company that guides customers through the entire product creation process.

Manfred Kunz

Manfred Kunz leads the Product Definition for Automotive Ethernet Solutions division within NXP and ensures the company's networking technology meets customers' future requirements for in-vehicle networks. Prior to this, he lead the architecture and engineering of the first Automotive Ethernet Smart Switch device at Marvell Semiconductor. He has been working in the Ethernet field for the last 21 years, focusing on Automotive Ethernet for the last seven years.

Trista Lin

Trista Lin is an onboard IT architect and technical specialist in E/E architecture design at Stellantis. She is responsible for TCP/IP architecture design and protocol deployment. Prior to Stellantis, she has eight years of industry experience in wireless network simulators and three years of research experience in open source software development. She holds a PhD degree in computer science from INSA Lyon (National Institute of Applied Sciences of Lyon), France, and a BS in mathematics and communications engineering from National Tsing Hua University, Taiwan. Her research interests lie in IT solution adaptation for cars toward software-defined architectures and services.

Markus Helmling

Markus Helmling works as a Senior Product Manager at Vector Informatik GmbH, Germany. His focus is on in-vehicle communication technologies, especially solutions for automotive Ethernet switches and communication gateways at the Embedded Software Department.
After completing his studies in Electrical Engineering/Information Technology at the Pforzheim University of Applied Sciences, Germany and initial experience in the automotive supply industry, he joined Vector Informatik GmbH in 2012.

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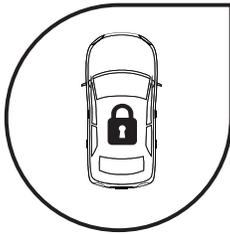
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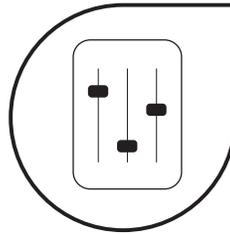
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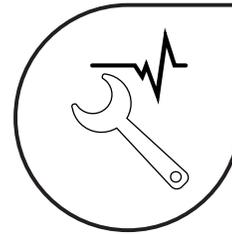
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SPEAKERS (Continued)

Martin Miller

Martin Miller is Associate Director in the Automotive Information Systems group of Microchip. The group is developing automotive networking solutions including PHYs, Intelligent Network Interface Controllers, and Audio/Video Companion ICs along with the required software stacks for network management, en-/decryption, etc. Martin Miller has participated in standardization committees like IEEE, OPEN ALLIANCE, ISO, and MOSTCO for more than 17 years.

Naresh Nayak

Naresh Nayak joined Robert Bosch GmbH in 2018 and is working as a Research Engineer in the field of Communication and Network Technology at the Corporate Research division in Renningen, Germany. He is involved in internal projects exploring novel technologies like software-defined networking and in-network computing for automotive use cases. Before joining Bosch, he earned his PhD degree from the University of Stuttgart in an interdisciplinary research cluster at the cross-section of manufacturing and communication technologies.

Takumi Nomura

Takumi Nomura is the vice-chair of JASPAR Next Generation High-Speed Network Working Group and a Chief Engineer of Honda Motor Co., Ltd. Before joining Honda, he was engaged for 15 years in research on applied technology of Ethernet. His current research interests include the next generation E/E architecture and automotive Ethernet technologies.

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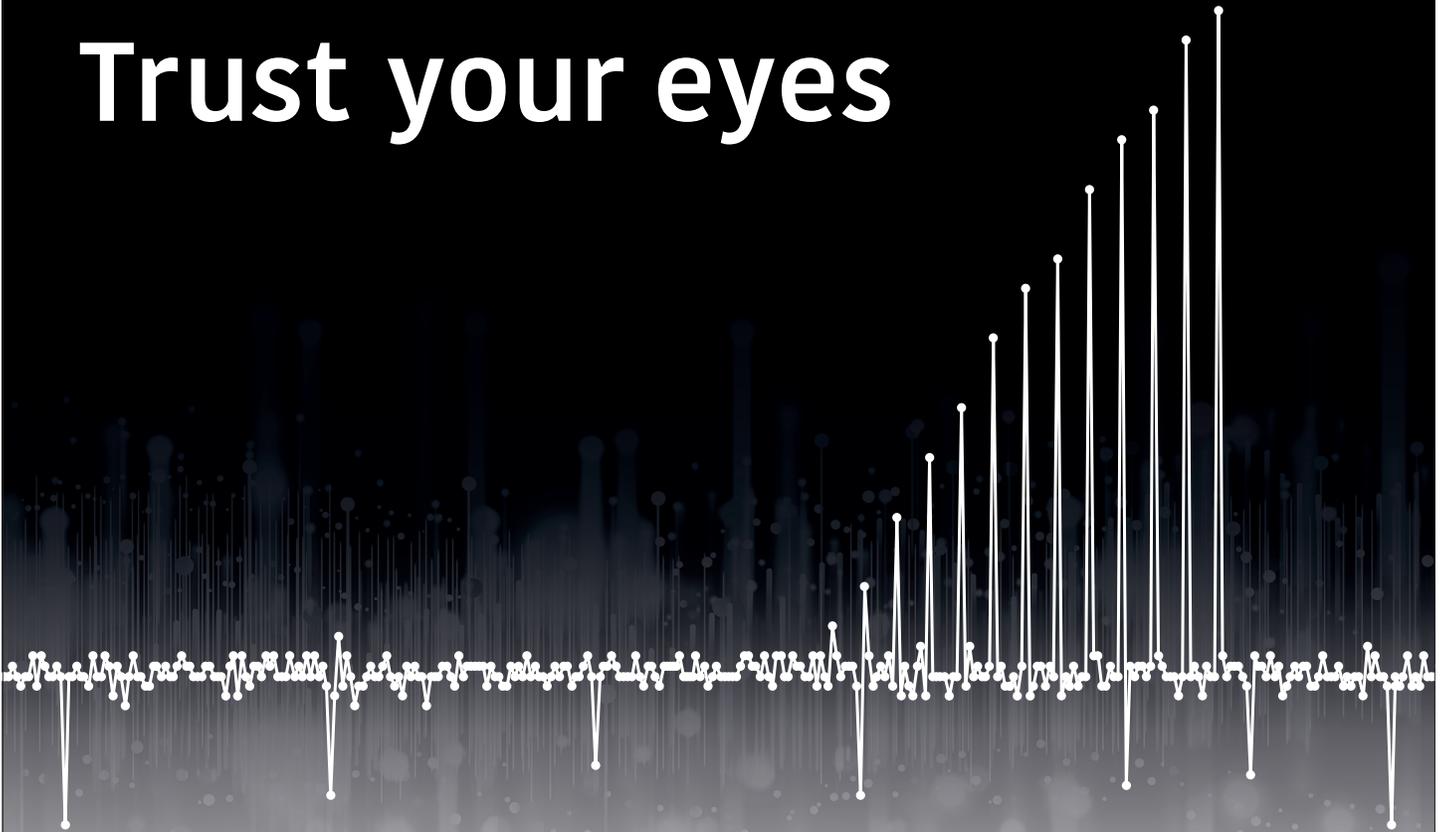
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SPEAKERS (Continued)

Don Pannell

Don Pannell has architected Ethernet switches and networking solutions for more than 25+ years, focusing on Automotive Ethernet solutions for the last 15-plus years. He has been an active participant and contributor in both IEEE 802.3 and IEEE 802.1 for almost 25 years. Don organized the 802.3 Call for Interest (CFI) for RTPGE which resulted in the 1000BASE-T1 Automotive PHY we have today, and he started the Time Aware Shaper project in 802.1, now known as IEEE 802.1Qbv. More recently, he helped start the new 802.1 Time-Sensitive Networking (TSN) Automotive Profile project.

Don has worked on the IEEE 802.1 AVB/TSN standards since their beginning, and he is currently Secretary of the IEEE 1722 working group and editor of the new IEEE 1722b standard (which standardizes end node protocols for AVB/TSN). He worked on his first IEEE standard in 1980 and was Vice Chair of the Board of the VESA standards association in 1990. He has been a lead architect for more than 30 years at companies including Sierra Semiconductor, I-Cube, Marvell, and now NXP. Don currently has more than 90 patents granted with more in the works, and he received his BSEE degree from Loyola University in California.

Razvan Petre

Razvan Petre is responsible for the Time-Sensitive Networking (TSN) product strategy in Spirent's Cloud & IP business unit. He helps design test and assurance solutions for next-generation TSN devices and networks. He spends a good amount of time discussing directly with chip vendors, Tier 1s, and OEMs to help them adopt TSN for their in-vehicle network (IVN).

Razvan has more than 15 years of experience in test and communication systems design, with a special focus on performance and conformance protocol testing across various domains such as telecommunications, automotive, industrial automation, and the public sector. He holds a MSc degree in Computer Science from Politehnica University of Bucharest, Romania.

Sebastian Schildt

Sebastian Schildt received his diploma degree in engineering-informatics in 2006 from the University Lüneburg working on efficient embedded network protocol stacks and a master's degree in computer science in 2009 from the Leibniz University Hannover researching misbehavior detection for resilient ad hoc networks. In 2015 he received his PhD degree in computer science from TU Braunschweig working on Delay Tolerant Networking systems for smart city and smart farming applications. Since 2015 he has worked on future vehicle computer software architectures and automotive OSS at Robert Bosch Corporate Research.

SPEAKERS (Continued)

Masato Shiino

Masato Shiino is a manager and senior engineer of Automotive Products & Electronics Laboratories of Furukawa Electric Co., Ltd. His team is currently developing in-vehicle optical harnesses. Masato Shiino received a BE degree in electronics from Chiba Institute of Technology. He is a member of IEEE, ISO, JSAE, JASPAR, OPEN Alliance, and IEICE.

Max Turner

Max Turner received his Dipl. Phys. from the University of Ulm, Germany in 1999. He joined BMW late in 2002 where he initially contributed to MOST and FlexRay. During a stay in the USA, he worked on V2x wireless systems and the DSRC standardization (IEEE Std 802.11p). After returning to Munich in 2008 Max started the introduction of Ethernet into Autosar and became part of the group creating the ISO 13400 'Diagnostics over IP' standard. For the following 10, years Max was a member of the team introducing Ethernet as a system-bus (including SOME/IP, XCP, DLT, AVB, and other protocols) into all BMW vehicle generations. For not quite two years, he joined Jaguar Land Rover in in the UK, where he gathered experience in the overall E/E architecture for automated vehicles as the lead architect. Since December 2019 Max serves as the automotive network architect for Ethernovia. He is and has been an active contributor to the AVB and TSN working groups of IEEE, ASA, Open Alliance, and AVnu for most of his career and is now also the editor of the IEEE P802.1DG automotive TSN profile.

Lars Völker

After pursuing his PhD in Network Security, Lars joined the automotive industry 11 years ago and worked for a well-known OEM in Munich. His focus was and still is on E/E architectures, Automotive Ethernet, and network security. As an Automotive Ethernet architect, he was the main author of SOME/IP and drove Ethernet Switch requirements in the OPEN Alliance to shape Switch products. At that point of time, MACsec started out as an optional feature. While being a part of the Security Architecture team, Lars successfully designed and introduced a world wide Key and Certificate Management Solution as well as Ethernet-based Network Security features for the vehicles of his previous employer. Today Lars is a Technical Fellow at Technica Engineering and reports directly to the CTO. In his role, he supports many OEMs to achieve their SOPs successfully today and to create the best possible architectures for the future.

Jean Walrand

Jean Walrand received his PhD in EECS from UC Berkeley and has been on the faculty of that department since 1982. He is the author of *An Introduction to Queueing Networks* (Prentice Hall, 1988), *Communication Networks: A First Course* (2nd ed., McGraw-Hill, 1998), *Probability in Electrical Engineering and Computer Science* (2nd ed., Springer, 2021), and *Uncertainty: A User Guide* (Amazon, 2019); and co-author of *High-Performance Communication Networks* (2nd ed., Morgan Kaufman, 2000), *Communication Networks: A Concise Introduction* (2nd ed., Morgan & Claypool, 2018), *Scheduling and Congestion Control for Communication and Processing Networks* (Morgan & Claypool, 2010), and *Sharing Network Resources* (Morgan & Claypool, 2014). His research interests include stochastic processes, queuing theory, communication networks, game theory, and the economics of the Internet. Jean Walrand is a Fellow of the Belgian American Education Foundation, a Life Fellow of IEEE, and a recipient of the Informs Lanchester Prize, the IEEE Stephen O. Rice Prize, the IEEE Kobayashi Award, and the ACM Sigmetrics Achievement Award.

Michael Ziehensack

Michael Ziehensack is Vice-President at Elektrobit (EB) with global development responsibility for Automotive Networks Software. He studied Computer Technology at the Vienna University of Technology where he received his MSc degree in 2000 and his PhD degree in 2004. For more than 20 years he has been working in the field of communication networks and embedded systems in various technical and management positions. In 2015 he became Managing Director of Elektrobit Austria, EB´s research and development site for Automotive Networks.

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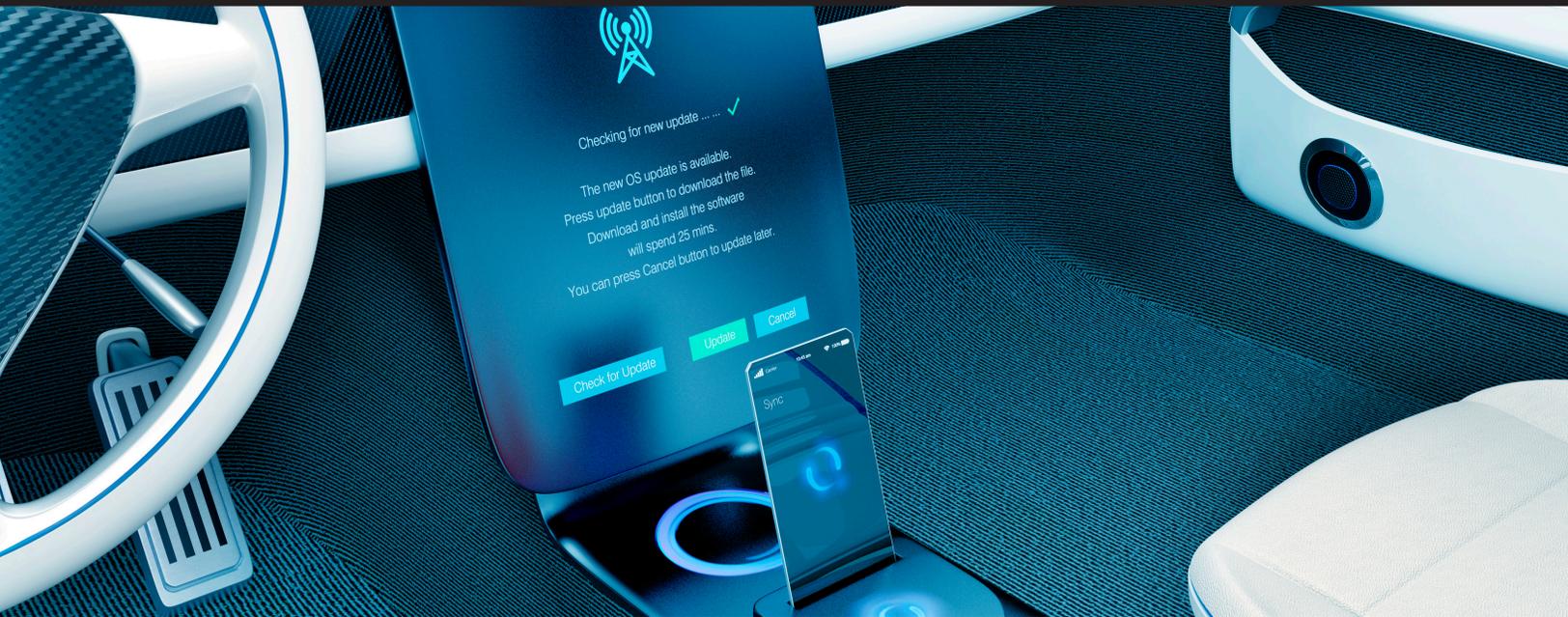
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