AutoSens USA
May 21-23 2024
Huntington Place, Detroit

DAY 1

	Tutorials Check-in open from 9:30am *for full pass holders only	
	141	**142 A-B**
10-1pm	**Mixed-Flow Traffic of CAVs and HDVs** Vehicular automation, in conjunction with connectivity, is proving to be both disruptive and transformative. After more than a century, the human is relinquishing control of the driving task to autonomous systems on roads. For the foreseeable future, the transition to a fully autonomous road transportation system will entail the coexistence of connected and autonomous vehicles (CAVs) and human-driven vehicles (HDVs) in what is commonly labeled as “mixed-flow traffic”. This introduces several potential challenges and opportunities due to the different driving characteristics and capabilities of humans and autonomous systems. Existing models and methods for the management and control of traffic networks are premised on HDVs. This tutorial will discuss the modeling, analysis, and implications of traffic- and network-related problems in mixed-flow traffic environments. It will illustrate potential risks, emergent phenomena, and	**Thermal Imaging: From Planck’s Law to ADAS Performance Improvement** Thermal imaging is a proven technology used for decades in many markets including defense, industry, and security. For ADAS it is gaining interest at a fast rate due to complementarity in advanced conditions with established sensor technologies. However, thermal imaging remains perceived as an expensive and niche technology. In this tutorial Lynred, a global leader in the thermal imaging sensor market, will demystify thermal imaging and will give you the keys to design your own system. After a landscape of thermal imaging applications and position with current sensing technologies, you will learn the building blocks of a thermal camera, the physical laws to consider and metrics related. Fields will be radiometry, optics, microelectronic, Image Signal Processing, AI & fusion. Those learnings will then be applied to estimate range detection on real use-cases

	opportunities to leverage CAV capabilities, as CAVs become more commonplace. In particular, it will discuss longitudinal and lateral interactions in mixed-flow traffic and consequent network-level impacts. **Dr Srinivas Peeta,** Frederick R. Dickerson Chair & Professor**, Georgia Tech**	like the future NHTSA PAEB rulemaking proposition or on your own. As a recreational ending, you will be able to manipulate a thermal camera! **Quentin Noir,** Product Manager, **Lynred**
1pm	Lunch for full pass holders	
2-5pm	**Title: ICAT: An Open Source Testbed for Connected and Autonomous Vehicles** In this tutorial, the researchers at the CAR Lab from the University of Delaware will present ICAT, a comprehensive open-source platform for developing connected and autonomous vehicles, highlighting the key areas of vehicle computing, ICAT hardware, Autoware integration, and remote testing. **Dr Weisong Shi**, Director CAR Lab, **University of Delaware** and **William He, University of Delaware**	**Camera Image Quality for ADAS - How Good is Good Enough?** This tutorial will provide a detailed understanding of the camera image quality standards and metrics that relate to ADAS (Advanced Driver Assistance Systems). The content will cover key image quality factors (e.g., sharpness, noise, distortion, and color) and the metrics that provide quantification of these factors (e.g., spatial frequency response, temporal noise, camera projection model, and color error), Discussion will include how to determine if key performance indicators (KPIs) are being met and how to relate these to camera system performance. Metrics will include those from the IEEE P2020 standard, ISO TC42 Photography standards, and novel image information metrics that relate to machine vision and object recognition. **Jonathan Phillips,** VP of Imaging Science, **Imatest**
4:30	Basic check-in opens **Exhibition opens**	
5.30 - 6.30pm	**Round table discussions in 141** All attendees can choose to join one of the following discussions: a) **Addressing the Challenges and Opportunities for Thermal Imaging in Automotive,** Cal Loo – Regional Sales Manager (USA) and Sebastien Tinnes – Global Market Leader (Automotive), **Lynred** b) **ASMPT**	

	EXHIBITION HALL
5:30 - 7pm	**Welcome reception in exhibition**

DAY 2

8:15	Check-in and exhibition opens
	Main Stage
	Chair: Robert Stead, Managing Director, **Sense Media**
8:45	**OPENING REMARKS** – **Robert Stead,** Managing Director, **Sense Media**
9am	**OPENING KEYNOTE – The Challenge of Moving to Smaller Pixels** The 8Mp 2.1um imaging sensor node has become popular for the current generation of autonomous vehicles. As the market further matures, there will likely be demand for increasing resolution in the luxury end of the market and, concurrently, cost-down measures applied to the existing feature set. Additionally, there is a persistent and permanent desire to reduce the size of camera modules. One potential solution to address these pressures is to reduce pixel size. Associated with this reduction, however, is a decrease in pixel sensitivity and a need to open the aperture of lenses to support the resolution and provide increased image luminance to the sensor. The change in aperture reduces the depth of focus of the lenses used and in-turn narrows manufacturing tolerances needed to maintain module performance. We examine the relationship between key performance parameters, such as modulation transfer function (MTF), effective resolution, sensitivity, SNR 1, data-rates and lens placement with respect to pixel size. We calculate an envelope to maintain current camera module performance as compared to the current 8MP 2.1um node and look at the effect on manufacturing tolerances. **Robin Jenkin,** Distinguished Engineer and Lead Imaging Scientist, **NVIDIA**
9.30	**KEYNOTE – On the Topic of Defining an AD Product with all Surrounding Stakeholders** For quite some time, executives and professionals have said that highly autonomous cars are just years away. Why don't we have more "self driving" cars given all the promises? This talk will contain my own reflections on why I believe it has been so hard. I will furthermore elaborate on the development of best practice and legal requirements that we see.

	I will talk about safety management systems, SMS, and also about the need to let safety concepts and requirements be primary drivers and not the opposite, meaning primarily making the function safe as we learn from gathered experience and data. I will present some research results with the purpose to enable a faster and safe ODD expansion. Finally I will speak about interesting things I have encountered during my years within the AD/ADAS community and world of standardization. **Hakan Sivencrona,** Senior Technical Lead – Safety, **Volvo Car Corporation**			
10am	KEYNOTE – Lead Sponsor, TBC			
10.30am	**EXHIBITION HALL** Networking coffee break in exhibition			
11am	**Press Briefing – 140F**			
	Main Stage	**141**	**142 A-B**	**142 C**
11.15am	**Thermal Imaging: Seeing the Unseen**	**Deep Learning and Machine Learning**	**Data Analytics and Simulation**	**Blending InCabin and Exterior Experiences**
			Chair: Alex Polonsky, Founder, **Detroit Autonomour Vehicle Group**	
11.15am	**Unlocking Pedestrian Safety with Automotive Night Vision.** Between 2010 and 2021, pedestrian fatalities in the US increased by 77%, the majority occurring at night, according to the Governors Highway Safety Association. In this presentation, Owl will address in detail upcoming regulatory mandates,	**An Efficient ADAS Stack: Integrating Multitask Models, Efficient Implementations, and Hardware Aware Optimization** Zenseact, in collaboration with Embedl, is enhancing autonomous driving technologies by creating an	**Accelerate and Scale AV Simulations on AWS** AD simulations are different from traditional CAE hi-fidelity physics simulations used for automotive product development. Unlike tightly coupled CAE simulations, AD simulations tend to be parallel, and are interruptible that scale to hundreds of thousands of vCPUs. There are primarily two types of AV simulations - Log	**An optical nervous system to Interconnect Sensors and artificial brains in AV** The connectivity of sensors with AI central units is key in ADAS and AV. This connectivity must be reliable, low latency, and high data rate. The presentation will explain how optical interconnections are very well positioned

	specifically from the National Highway Traffic Safety Administration and EURO NCAP for night-time pedestrian safety. Within five years, all new cars will have to have nighttime PAEB as part of their ADAS suite. Previously, the challenge for deployment has been the cost of thermal vs. visible light cameras and the lack of camera resolution. Owl will highlight the architectural changes that are enabling cost-effective, high-resolution, low-power next-generation cameras that will be embraced by automotive OEMs for ADAS and autonomy deployments. Join us to explore the possibility of greater pedestrian safety with the reality of thermal night-vision. **Chuck Gershman** CEO, Co-founder	advanced vision stack for ADAS and AD systems. This effort addresses the key challenges of managing memory, energy, and computational efficiency in deep learning models. The approach emphasizes there's no one-size-fits-all solution; rather, success relies on continuous innovation and the expertise of deep learning specialists and engineers. Zenseact adopts multiple innovative strategies to streamline deep learning applications, such as custom C++ and CUDA implementations for faster execution and multitask deep learning models to reduce computational redundancy. These models combine tasks like semantic segmentation and lane	Simulation and Virtual Simulation. This presentation will cover: 1/Challenges running large scale AV simulations. 2/ Recommendations to run large scale AV simulations cost effectively. 3/ Customer references **Paul George**, World Wide Specialist - Autonomous Vehicles, **AWS**	compared with other legacy electrical links, attending to demanded data rates, signal integrity, EMC performance, and future-proven data-rate scalability. IEEE Std 802.3cz, an automotive optical physical layer specification supporting data rates up to 50 Gb/s, was released in March 2023. The main differences between the optical physical layers for automotive and data centers will be described, attending to requirements, physical layer design, photonics, DSP, link budget, dependability functions, and other distinctive automotive features. The presentation will explain why traditional implementation of optical transceivers, from circuit design and IC packaging points of view, is no longer valid for automotive and which new approaches are needed, considering the different use cases.

	Owl Autonomous Imaging	detection into a single network, optimizing resource use. Additionally, hardware-aware model optimization, enabled by the Embedl Model Optimization SDK, further refines performance by tailoring model architectures to leverage hardware capabilities fully, resulting in significant improvements in efficiency and execution speed. We explore many of these aspects in our talk, with a special focus on model optimization. **Andreas Ask,** Deep Learning Researcher, **Embedl** and **Speaker Representative, Zenseact**		**Rubén Pérez-Aranda,** CTO**, KDPOF**
11.40am	**Expanding the Wavelength Range of ADAS/AD Cameras** This presentation will highlight	**The Significance of Iterative Understanding of ML Datasets: Quality, Model Performance, and Actionable Insights,**	**A Data-Driven Autonomous Driving System for Overtaking Bicyclists,** **Shan Bao,** Associate Professor and Department Chair, Industrial &	**Vehicle Computing: A New Era for Automotive Industry** Vehicles have been majorly used for transportation in the last century. With the

	challenges and solutions for the optical alignment and testing of cameras for the wavelength range beyond the VIS spectrum and strategies to achieve the optimal optical performance at automotive grade production requirements. **Dirk Seebaum,** Product Manager Automation, **TRIOPTICS**	Machine Learning (ML) models are only as good as the datasets they are trained on. The quality of the dataset plays a pivotal role in determining the performance and reliability of the resulting models. However, achieving high-quality datasets is not a one-time task; it requires an iterative process of understanding, assessing, and refining data to enhance model performance continually. This presentation delves into the critical role of iteratively assessing dataset quality concerning model performance in the realm of Machine Learning focusing on the ADAS/AD use cases. **Tommy Johansson,** Perception Expert, **Kognic**	Manufacturing Systems Engineering, **University of Michigan-Dearborn;**	proliferation of onboard computing and communication capabilities, we envision that future connected vehicles (CVs) will serve as a mobile computing platform in addition to their conventional transportation role for the next century. In this presentation, I will present the vision of Vehicle Computing, which is a new era for the automotive industry. Under this vision, CVs are the perfect computation platforms, and connected devices/things with limited computation capacities can rely on surrounding CVs to perform complex computational tasks. **Weisong Shi**, Director - The CAR Lab, **University of Delaware**

12.05	**Lighting Up the Dark: How new PAEB safety requirements can be met in the most economical way by combining next generation thermal Imaging optics and sensors** **Bendix De Meulemeester,** Director Marketing & Business Development, **Umicore Electro-Optic Materials**		**Next-Gen Autonomous Vehicle Testing: The Transition to Software Defined Vehicles & Late sensors Fusion Through Physically Accurate Sensor Simulation** **Lionel Bennes**, Product Manager, **Ansys**	**Situation Understanding based on the Past, Present, and Future of** **Surrounding Traffic Scene and Driver's Awareness** **Darren Chen,** Head of Vision Software, **LITE-ON Technology Corporation**
12.30	**AI- boosted LWIR imaging - Diffusion Models can improve LWIR image classification where training data is not available.** In this presentation, we show some drawbacks of the well-known Denoising Diffusion Probabilistic Models (DDPMs) - one of the most well-known synthesis approaches - that emerge when applied to thermal images in automotive scenarios for synthesis of novel objects. We then show that, based on our internal research effort, we are able to		**Meeting the growing demand for high-quality training data through an integrated simulation solution** **Matt Daley,** Director, **rFpro**	

	improve these results and to generate novel images of objects better than the baseline. Our synthesized images exhibit high domain fidelity and realistic appearance. Finally, to further demonstrate the potential of this image synthesis method, we show that using synthesized images of a rare category we can improve its result on an object classification task. **Yonatan Dishon,** Director of AI, **Adasky**			
12.55	**EXHIBITION HALL Networking Lunch Break**			
14.30	**PARK ASSIST AND Low-Speed Maneuvers**	**AI for AVs: Paving the Way for Autonomous Vehicles**	**Image Sensing Innovations**	**Sensor Fusion: The Power of Integration**
	Chair: Juergen Hoellisch, Founder and CEO, **Hoellisch Consulting**			
14.30	**Mastering Self-Parking: Navigating the Challenges with Innovative Driver Assistance Technologies**	**AI in Automotive: Accelerating Automated Driving Technologies Anshuman Saxena,** Vice	**4x4 RGBC: A CFA with the best of Bayer and RCCB **The pursuit of enhanced low-light imaging capabilities has prompted the use of RCCB Color Filter Arrays, which replace	

	This presentation addresses key challenges in driver assistance systems, with a focus on self-parking mechanisms and safety. We explore the limitations and challenges of current sensors, particularly in accurately detecting small objects such as road debris and hazards in different road conditions. Our analysis employs a comparative approach, assessing technologies like LiDAR and stereo vision in self-parking scenarios, including operations in nighttime and adverse weather conditions. The presentation will specifically highlight the precision with which these technologies facilitate navigation in tight spaces, especially at night. Furthermore, we will present experimental results that showcase stereo vision's capability to detect small objects at night, like tires at distances of 80 meters without headlights – cameras must be	President of Product Management and Head of Advanced Driver Assistance Systems (ADAS) and Automated Driving (AD) Products, **Qualcomm**	the traditional green color filters in Bayer CFAs with clear filters. However, the RCCB's compromised color accuracy has resulted in the continued use of the Bayer CFA. We propose a 4x4 RGBC pattern which combines the superior low-light SNR of RCCB with the excellent color accuracy of Bayer. Half of this pattern's pixels are clear, while the remaining half is distributed among red, green, and blue colors following a density and arrangement similar to the Bayer pattern. Leveraging multispectral demosaicking techniques, we achieve a high chrominance bandwidth despite the sparse distribution of RGB pixels. This high chrominance bandwidth enables long-distance traffic light recognition comparable to that of the Bayer CFA. **Tripurari Singh,** CEO, **Image Algorithmics**	

	able to detect obstacles in low light conditions to be considered for self-parking applications **Leaf Jiang,** CEO & Founder, **NODAR**			
14.55	Presentation by **Berveleen Mashonga,** Product Manager, **Hyudai Mobis**	**How Cameras Read the Road** Using visible cameras to localize off lane features is vital to the future of ADAS. This session examines the interaction of AI-based detectors to lane characteristics that affect the safety and performance of lateral control systems. **Phil Magney,** Founder & President, **VSI Labs**	**Introducing the Next Generation of External Camera Vision Systems and Tools** **Patrice Roulet Fontani,** Vice President, Technology and Co-Founder, **Immervision**	

15.20	**Advantages of Radar in Automated Parking** **William List,** Field Applications Engineer, and **Justin Weeks,** Product Marketing Engineer, **Texas Instruments**	Presentation by **Nimrod Brickman,** VP Business Development, **MOBILEYE**		

15.55	Networking coffee break			
16.40	**Functional Safety**	**Market Forces and Horizon Scanning**	**Driving Vision: Innovations and Standards in Automotive Safety Imaging**	**What could we learn from..?**
	Chair: Tiana May, Features Writer, **Future Transport News**			**Chair: Robert Stead,** Managing Director, **Sense Media**
16.40	**How existing ADAS sensors can support measurable safety based on ground truth** **David Bruemmer,** Board Member, **the Autonomy Institute**	**Advancing Autonomy: The Future of Vehicle Technology** The automotive industry is evolving at a rapid pace, re-shaping the current and future driving experience. As trends in electrification and software-defined vehicles drive opportunities for innovation in vehicle autonomy, Julie will discuss the increasing standardization of Advanced Driver Assistance Systems (ADAS), the outlook of	**Automotive Use Case Studies for Long Distance and Night Object Detection Using Latest Image Sensor Cameras** Evolving regulations are directing the automotive industry to sharply adopt and transition to higher levels of safety, providing solutions that prevent death and injuries on roads around the globe. In this study we focus on latest 2.1 µm image sensors and their ability to detect various objects. We use different theoretical metrics in daylight and night conditions, to showcase detection abilities in typical automotive scenarios. Fulfilling latest OEM scenarios and	

		automated driving systems as S&P Global Mobility projects more than 40% of vehicles sold globally will be Level 2 and above in 2024, and how regulation and mandates are impacting technology deployment by automakers. **Julie Chaote,** Consulting Principle, **S&P Global Mobility**	requirements, these objects include vulnerable road users and small objects at various distances. Using cameras with different field-of-views we demonstrate that latest Hyperlux sensors outperform other solutions and enable detection of these various objects at long distances thus making possible up to 130 KPH speeds and level 3/3+ of autonomous driving. We compliment the studies with numerous images and videos. **Sergey Velichko**, Sr. Manager, **onsemi**	
17.05	**Pioneering Next-Generation Deep Ultrasound for Autonomous Mobility** **Mihai Caleap,** CEO & Founder, **Calyo**	**Semiconductor Scarcity and ADAS: Rethinking Automotive Sourcing for a Resilient Future** The automotive industry is currently at the crossroads of a technological revolution, with ADAS standing as a beacon of innovation. However, the journey towards safer roads has encountered an unexpected obstacle — the global shortage		

		of semiconductor chips. This presentation will discuss relationship between semiconductor components and ADAS, unraveling the profound impact of the shortage on OEMs and the consequent evolution of sourcing strategies. At the heart of ADAS lies the relation between sensors and semiconductor chips. This presentation will explain the increasing role of semiconductor chips in cameras, radar, and LiDAR. We will compare the semiconductor content between these three main sensors. We will also explore the need of semiconductors for the computing needs to process data and put it in relation with the level autonomy of vehicles. **Pierrick Boulay**, Senior Analyst –		

		Automotive Semiconductor, **Yole** Group		
17.30	**Panel Discussion: Future-Proofing Functional Safety Strategies for Emerging Technologies and Compliance Demands** How do we navigate the dynamic landscape of functional safety in sensing technology for ADAS and AVs? Discover strategies to ensure robustness and adaptability in functional safety for the ever-evolving automotive technology; learn how to proactively address the complexities of functional safety, ensuring that your approach remains effective in the face of rapid changes in the automotive landscape; and explore future-proofing strategies, offering key insights into emerging technologies and evolving compliance demands. In this panel, join industry leaders, regulatory experts, and technology	**Panel Discussion: How do we Ensure L3-4+ Cars are Insurable?** • **Moderator: Mark Fitzgerald,** Director, Autonomous Vehicle Research **TechInsights**	**Panel Discussion: Standards for Safety: The Crucial Role of IEEE P2020 Automotive Image Quality Working Group** Join us for a compelling panel discussion highlighting the pivotal role of the IEEE P2020 Automotive Image Quality Working Group. As the ADAS/AV landscape evolves, the IEEE P2020 Standards have emerged as a linchpin, establishing vital guidelines and benchmarks to enhance vehicle safety by ensuring reliability and consistency of the imaging systems. Robust standards are paramount for automotive imaging technologies; this panel will outline how the efforts of the working group members have contributed to consistency and reliability in automotive imaging, from addressing image processing challenges to ensuring cross-system compatibility.	**Panel Discussion: What can Automotive learn from the Military?** • **David Bruemmer,** Board Member, the **Autonomy Institute** and Senior Consultant, **DARPA** • **Sebastien Tinnes,** Global Market Leader, **Lynred**

	innovators as they dissect challenges and opportunities in maintaining functional safety amidst technological advancements. This discussion provides a unique opportunity to gain a deeper understanding of the measures needed to navigate and thrive in the dynamic realm of functional safety for sensing technology in ADAS and AVs. • **Moderator: Tiana May,** Features Writer, **Future Transport News** • Divya Garikapati, Woven by Toyota • **Hakan Sivencrona,** Senior Technical Lead – Safety, **Volvo Car Corporation** • Charles Gu, Aptiv		Gain profound insights into the crucial role these standards play in advancing the technological framework, elevating safety and efficacy, and shaping the future of autonomous driving through standardized and reliable automotive imaging technologies. • **Moderator: Margaret Belska,** IEEE P2020 Automotive Image Quality Working Group, **Chair** • **Sarah Kerr,** Imaging Scientist, **Imatest** • **Shaheen Amanullah,** Director – Camera Systems and Integration Solutions, **OnSemi** • **Janine Voss,** Image Quality Scientist, **Image Engineering**	
18.15	**END**	**END**	**END**	**END**

18.15	**Evening Networking Reception inc. Speed networking**

DAY 3

8:30	**Check-in and exhibition opens**			
	Main Stage	**141**	**142 A-B**	**142 C**
9am	**Centralised In-Vehicle Architecture**	**Infrastructure, V2X, and Connectivity: Creating a Seamless Ecosystem**	**Advancements in Image Quality**	**Rethinking LiDAR**
		Chair: David Howard, Founder and Principal, **DLH Consulting**	**Chair: Robin Jenkin,** Distinguished Engineer and Lead Imaging Scientist, **NVIDIA**	
9am	**System on Chip (SoC) for the Software Defined Vehicle** The software-defined vehicle goes hand in hand with a centralized vehicle and electric/electronic (E/E) architecture. Today, numerous electronic control units (ECU) will generally control different functions in the vehicle, but soon only a few central vehicle computers will	**The Future of V2X (and the potential impact of SAE J3216)** Mass robotaxi deployment at scale will require a level of cooperation only enabled through C-V2X. This session would be a decomposition of C-V2X through the lens of SAE J3216. **Dr Egil Juliussen**,	**Image pre-processing for DNNs in ADAS and Autonomous Vehicles Applications with Safety and Image Quality In Mind** **Alexis Lluis,** Technical Director – Imaging**, Arm**	**3D Roadway Scene Object Detection with LiDARs in Snowfall Conditions** Although LiDARs demonstrate good performance in clean and clear weather conditions, their performance significantly deteriorates in adverse weather conditions such as those involving atmospheric precipitation. This may render perception capabilities of autonomous systems

	unite multiple system functions from previously separate domains. In order to achieve this, it is necessary to have new computers with a powerful processor, known as a system on chip (SoC). This presentation will review the latest innovations and technology related to centralized vehicle architecture and what benefits it will bring for both OEMs and consumers. **Auston Payyappilly,** Sr. Manager Product Management, **Bosch**	Sr Partner and Principal Analyst, **VSI Labs**		that use LiDAR data in learning-based models to perform object detection and ranging ineffective. While efforts have been made to enhance the accuracy of these models, the extent of signal degradation under various weather conditions remains largely not quantified. In this study, we focus on the performance of an automotive grade LiDAR in snowy conditions in order to develop a physics-based model that examines failure modes of a LiDAR sensor. Specifically, we investigated how the LiDAR signal attenuates with different snowfall rates and how snow particles near the source serve as small but efficient reflectors. Utilizing our model, we simulate LiDAR data in snowy scenarios, enabling a comparison of our synthetic data with actual snowy conditions. **Ghazal Farhani, PhD,** Research Officer - **Automative and Surface Transportation, Research Council Canada** and **Taufiq Rahman,** Team Lead -

				Connected & Automated Vehicles, **National Research Council Canada**
9.25am	**Bridging the Infrastructure Bandwidth Challenges for Centralized In-Vehicle Architectures** There is an interplay of requirements between the three main elements of an ADAS/AD system - the sensor, the ECU, and the SerDes connecting between them. The growing resolutions of the sensors, for example, forces higher bandwidth requirements on the SerDes, while the SoC's demand for sensor fusion has implications on the amount and type of sensors spread across the vehicle. This session will review the growing requirements of the ADAS system elements -		**Advanced Image Processing of Non-RGB CFA Sensors for Automotive Applications** While RCCB, RYYCy, and RCCG sensors provide significantly better low light sensitivity, it is also well-known in the automotive industry that these types of non-RGB CFA sensors suffer from poor Red / Yellow traffic light discrimination. Even this severe drawback does not stop some major Tier-1 and OEMs from continuing to adopt RCCB, RCCG, and RYYCy sensors in real products. For example, Mobileye uses RYYCy sensor, and Tesla uses RCCB sensor, and we are seeing RCCG also being adopted. That demonstrates how important these non-RBG CFA sensors are for ADAS and ADS applications. indie's brand new, up-coming iND880 video processor resolves the	**A New Approach to Comprehensive LiDAR End of Line Test and Calibration for LiDAR Volume Production** **Sebastian Frisch,** Product Manager – Automotive, **FiconTEC**

	cameras, radars, LiDARs and SOCs. We will also address the resulting requirements imposed on the SerDes connectivity solution including bandwidth, EMC, frequency, link distance, time synchronization and fast boot. **Daniel Shwartzberg,** Director of Business Development and System Solutions, **Valens**		Red / Yellow traffic light differentiation issue of RCCB, RCCG, and RYYCy type sensors as well as addresses many other HDR image quality improvement. The solution includes a redesign of the ISP with specialized algorithms and ISP architecture targeting non-RGB CFA sensors. This new ISP technology allows automotive computer vision applications to take full advantage of the improved low light SNR provided by the non-RGB CFA sensors without the Red / Yellow traffic light discrimination issues. **Peng Lin,** VP & Chief Technology Officer - Vision BU, **Indie Semiconductor**	
9.50am	**Optimizing Data Transport Architectures for Automotive AI, ADAS, and Embedded Vision System-on-Chip (SoC) Architectures** This presentation addresses the challenges and solutions in data transport for automotive AI,	**Fireside Chat: Shaping the Global Automotive Landscape with V2X Technologies, in conversation with Qualcomm's Jim Misener** Jim Misener, Global V2X Ecosystem Lead at Qualcomm Technologies, Inc. and David Howard,		

	ADAS, and embedded vision systems, focusing on Networks-on-Chips (NoCs) in RISC-V and Arm-based SoCs. It highlights the 'memory wall' issue and emphasizes NoC implementation's role in optimizing performance, power efficiency, and cost. Key points include evaluating NoC protocols for adaptability and efficiency in automotive SoCs, introducing frameworks for cache-coherent and non-coherent applications, and emphasizing early assessment of physical design constraints to reduce interconnect area and power usage. The presentation also explores challenges in multiprotocol and cache coherent interconnects and the importance of ISO26262 certification for safety. Integrating Arteris' NoC solutions with advanced processor architectures is	a distinguished executive with expertise in Strategy, Operations, Mobility, and Transportation Technology, come together for an insightful fireside chat. This conversation explores the growing significance of V2X technologies in the automotive sector and their transformative impact on a global scale. As smart city planning, urban economic development, and transportation innovation redefine the landscape, the dialogue will highlight key trends influencing the future. Drawing from his extensive experience as a former Presidential FHWA SES Appointee and NCDOT Chief Dep. Secretary, David Howard engages with Jim Misener to shed light on Qualcomm Technologies' pivotal contributions to the evolution of V2X technologies.		

	presented as a means to achieve more efficient, flexible, and high-performing automotive SoCs. **Frank Schirrmeister,** VP Solutions and Business Development, **Arteris**	Discover the collaborative efforts propelling the automotive industry toward a safe, connected and intelligent future. **Jim Misener,** Global V2X Ecosystem Lead, **QualComm** (fireside chat with David Howard)		
10.15 am	**EXHIBITION HALL Networking coffee break**			
11am	**E/E Architecture Evolution**	**What's next for RADAR?**	**Camera Systems and Technologies**	**Ensuring Quality Data Capture**
	Chair: **Frank Schirrmeister,** VP Solutions and Business Development, **Arteris**		Chair: **Phil Magney,** Founder & President, **VSI Labs**	
11am		**How to keep Improving Radar Resolution without Adding more Antenna** L2+ systems like highway automated driving remain too expensive and functionally limited for widespread use. A key limitation is still the resolution and range at which radar sensors can	**Why Stray Light (Flare) is an Issue for Automotive Cameras** **Paul Romanczyk,** Senior Imaging Scientist, **Imatest**	**Navigating Data Challenges in Sensor Data Acquisition: A Comprehensive Exploration** **Adrian Bertl,** Strategic Product Manager, **b-plus Technologies GmbH**

		detect and separate objects. While this challenge has traditionally been addressed by adding more antenna channels, this approach is reaching practical limits on size, power, and cost. Distributed Aperture Radar (DAR) technology overcomes this limitation by using multiple Medium Range Radar (MRR) sensors coherently as a single radar system. DAR makes it possible to create significantly larger apertures, enabling azimuth resolutions of 0.2 degrees or better and accuracy of 0.03 degrees or better, surpassing imaging radar capabilities. This can be achieved with minimal power consumption (5-10 W) and the cost of only a few standard MRRs. We show real-world resolution and accuracy performance through corner reflector and scenario measurements, demonstrating the ability to solve challenging radar		

		scenarios even beyond 200 meters. In the long run, the DAR approach can remove the need for lidar in ADAS systems. **Antonio Puglielli,** Vice President, **Zendar**		
11.25	**Low-Latency and Low-Power Video Compression in Automotive** The presentation addresses the challenges in transmitting image and sensor data for Autonomous Driving (AD) and Advanced Driving Assistance Systems (ADAS), due to increased bandwidth and power demands. Traditional compression methods like AVC/H.264 or HEVC/H.265 cannot meet the low latency, power, cost, complexity, and thermal efficiency requirements. JPEG XS, developed by intoPIX under the JPEG Committee, offers a solution with its design for lightweight, low-complexity, low-	**Better Localization with Better Data** **Noah Gedrimas,** VP of Strategy, **GPR**	**Enabling Technology for Reliable Miniaturization of ADAS Sensors** Anisotropic Conductive Film (ACF) will be discussed as a key enabler for miniaturization and cost reduction of automotive-grade sensors. The adhesive film with dispersed conductive particles is a superior substitute for solder pastes, mechanical clips, and wire bonding, all of which have inherent vulnerabilities when the form factor of sensors shrinks. By optimizing the particle size, film thickness, and particle configuration, these films ensure design freedom for variations in architecture, and safeguard that fine pitch applications can achieve connectivity without the risk of shorts. Finally, a particle-arrayed ACF is described as a new	**Overcoming Perception Challenges in AD: The Novel Approach of Augmented Data Utilization** In this insightful presentation, neurocat will delve into the innovative approach of augmented data generation, a method distinct from traditional synthetic data approaches and simulation-based techniques, offering enhanced fidelity and relevance for autonomous driving (AD) development. Addressing the critical challenge of creating highly realistic datasets, especially under adverse weather conditions like rain, fog, and snow, neurocat introduces novel augmentation techniques designed to improve the robustness of perception functions in

	latency, and high-quality lossless compression, supporting ratios from 2:1 to 14:1. This standard allows for efficient compression of high-definition content, reducing bandwidth, power, and cost without sacrificing quality. How can we address the automotive industry's needs? One answer is by enabling direct compression of raw sensor data and eliminating the need for debayering, thus preserving quality and reducing storage. This technology supports multi-platform interoperability across ASIC, FPGA, CPU and GPUs. **Ben Runyan,** Director of Business Development - North America, **IntoPIX**		solution for further miniaturization. **Deborah Nash-Makita,** Senior Researcher, New Business Development **Dexerials America**	AD systems. Through empirical evidence and collaborations with industry-leading teams, the session will highlight the significant benefits of using augmented data for training and validating perception functions, particularly in handling edge cases. **Florens Greßner,** CEO**, Neurocat**
11.50	**Leaping Forward to Next Levels of Intelligence – Incorporating ADAS in IVI domain**		**NGBase-T1 Ethernet To Streamline Automotive Sensor Network** **Yunteng Huang,** CEO, **Aeonsemi**	**Investigating the Performance of Perception Sensors in Winter Conditions**

	In the automotive market, especially in China, electronic and electrical architectures are evolving towards central computing. This trend can be seen in the integration of the infotainment and ADAS systems. By combining the ADAS function into the cabin, the cost of the ADAS controller can be eliminated saving costs. The ultrasonic sensors and connector required to achieve the ADAS function can be added to the cabin domain at a relatively low cost. Siengine has embraced the central computing trend with its SE1000 chip designed to cater to the ever-increasing demand for multimedia in the cabin, while also providing the necessary computing power to support the complex ADAS algorithms. This talk will discuss the central computing trends and its impact and benefits of combining infotainment and			**Mike Dempsey,** Managing Director, **Claytex**

	ADAS systems into one chip. We will also explain several innovative designs we have developed to empower the trend with this chip. This talk will also cover the critical role AI plays in the combined solution and how partnerships – like the integration of Synopsys's AI IP into SiEngine's SE1000 – can speed time to market. **Hongtao Jia,** Senior Product Architect, **SiEngine Technology Co., Ltd.**			
12.15			**MEMS Actuator Application in Automotive Camera** **Colin Kwan**, President and CEO, **MEMS Drive Inc**	**Critical Data Challenges in AV Development, and their Mitigation** **Dr Bruno Sanguinetti,** Co-Founder and Head of R&D, **Dotphoton**
	EXHIBITION HALL			
12.40	**Networking Lunch Break**			
	WHY DO WE DO THIS? - MAIN STAGE			
	Chair: Robert Stead, Managing Director, **Sense Media**			
14.15	**Closing Keynote: Kristen White,** Chief Counsel – Federal Highways Administration, US **Department of Transport**			
14.45	**Panel discussion: What We Do Matters: The Importance of Autonomous Vehicles for Accessibility and Equity**			

	This panel will seek to better understand the transformative impact of autonomous vehicles on societal accessibility and equity. Exploring the intersection of cutting-edge technology and social responsibility, the discussion will emphasise the pivotal role autonomous vehicles play in creating a more inclusive and equitable transportation landscape. Expert stakeholders will examine how these innovative technologies can break down barriers for individuals with diverse mobility needs, fostering a future where transportation is not just efficient but also accessible to everyone. Furthermore, we will consider the many factors at play when designing and developing AV technology to ensure that the technology is available and accessible to all. This panel aims to highlight the ethical and practical implications of embracing autonomous vehicles as a means to enhance accessibility, promote equity, and reshape the way we navigate and connect within our communities. • **Moderator: David Howard,** Principal and Founder, **DLH Consulting** • **Maria Town,** President and CEO, **American Association of People with Disabilities**
15.25	**Closing Remarks – Robert Stead,** Managing Director, **Sense Media**
15.30	**Close**