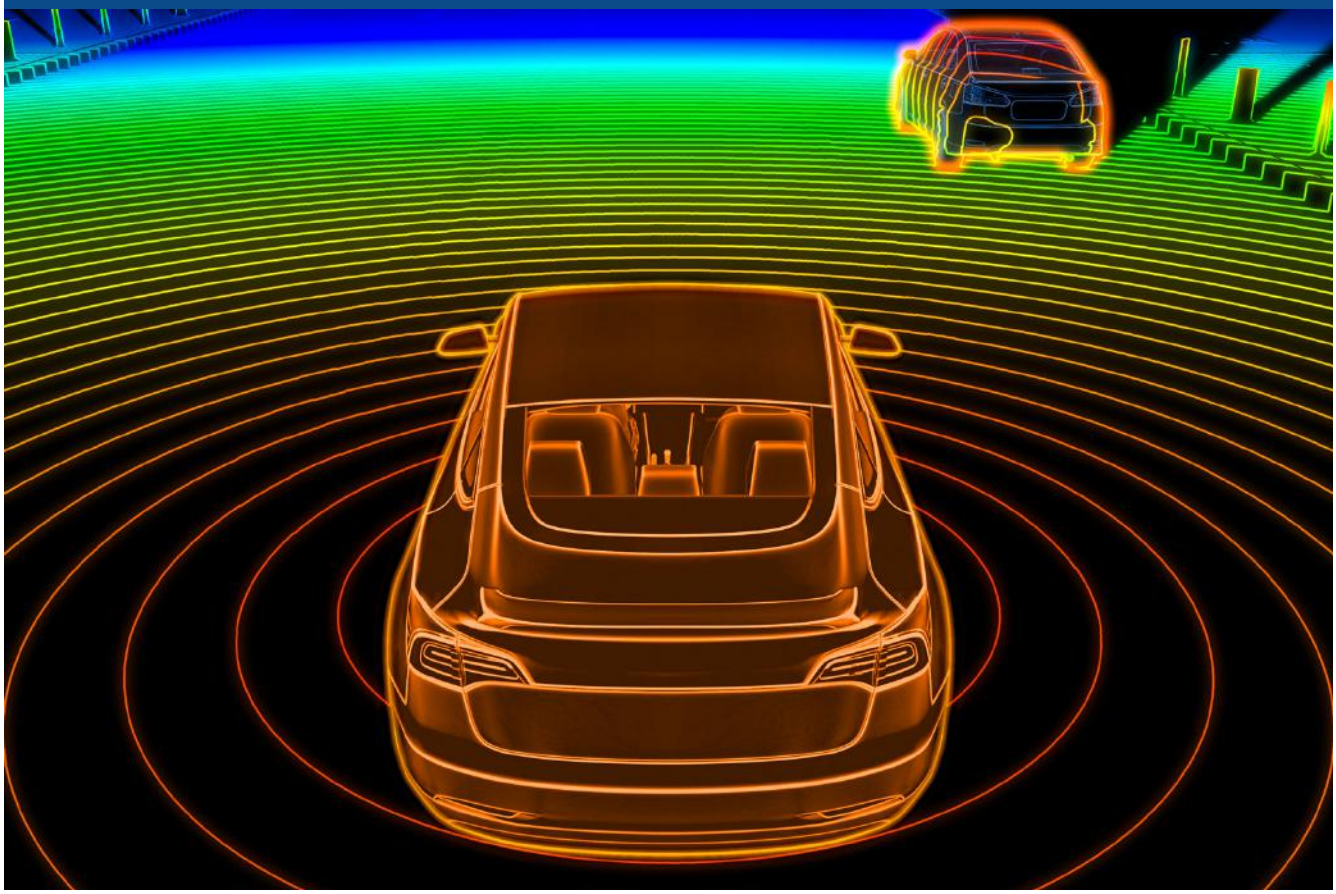
DVN
Lidar

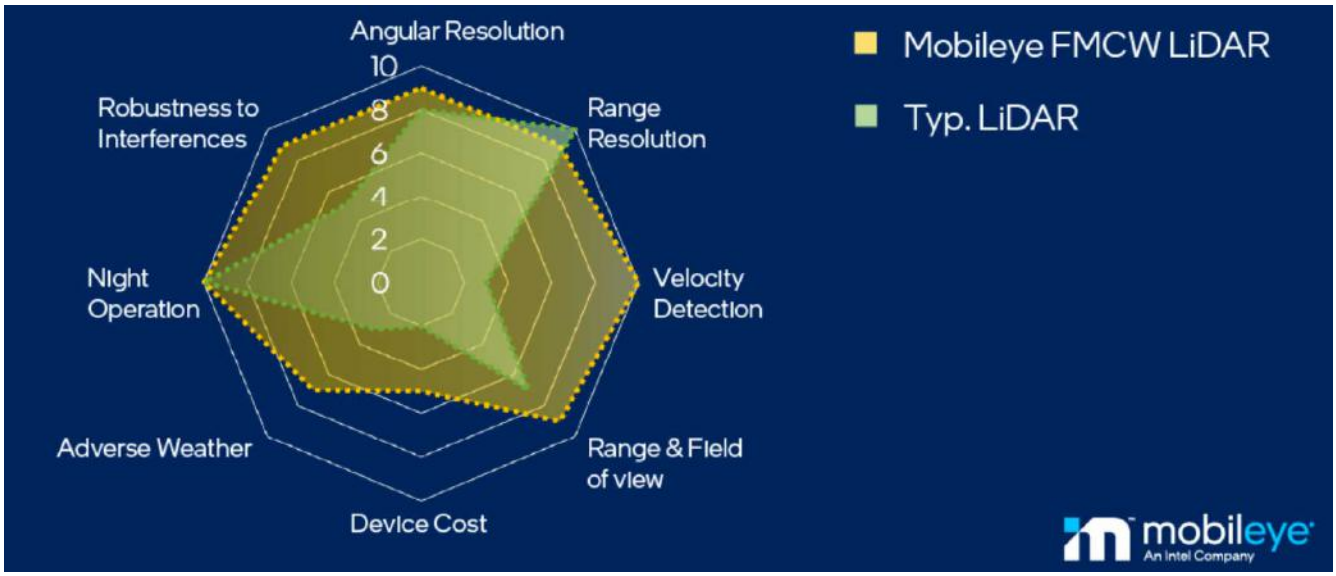
# Monthly newsletter #31

OCTOBER 2, 2024



**EDITORIAL**

# FMCW, ToF Lidars Grapple for Market Share




Mobileye will shut down their FMCW lidar development unit by year's end, lurching around 100 employees. It's because the company now considers FMCW lidar 'less essential' for achieving $L^3$ eyes-off systems, thanks to imaging radars, which are improving, and time-of-flight (ToF) lidar systems, which are dropping in cost.
Nevertheless, Aeva, in partnership with Nikon, plans to start mass production soon of FMCW lidars to be used by Daimler Trucks starting in a couple of years. They're doing so because autonomous trucks need lidars with 300m+ of range, which is difficult to achieve with ToF lidars. And Honda has invested in SiLC for FMCW development, as well.
So at the moment it looks like ToF lidar technology could predominate in cars and AVs for the foreseeable future, but it's certainly not yet time to hold a funeral for FMCW. In this issue of your DVN-Lidar Newsletter, we bring you details and coverage of all of this.

**Upcoming DVN-Lidar Events 2024-25:**

- Lidar Conference in Wiesbaden, 18-19 November
- Lidar Deep Dive II in Stuttgart, 8-9 April
- Lidar Tech Expo in Hangzhou, 4-6 June (DVN co-hosts with Enmore)
- Lidar Deep Dive III in Detroit, 9-10 September (combined with DVN Lighting Workshop)

We're ever so glad you're here with us in the DVN-Lidar community. Enjoy this 31st newsletter!

All the best,

**Alain Servel**

*DVN LIDAR ADVISOR*

REPORT

# Report: DVN-Lidar Deep Dive III in Detroit


27 attendees joined at the Hotel Novi for the Lidar Deep Dive workshop; they came from GM, Aeva, Cepton/Koito, Hesai, Innoviz, Robosense, Luminar, Valeo, Voyant, AMS Osram, AGC Wideye, FKA, NTT, Hitachi High Tech, Saint Gobain, and Steerlight. Presentations and detailed meeting minutes are available for attendees and DVN-Lidar Gold members.

Here's a summary of the proceedings:

## Session 1

Lidar L3 / Business Conditions (Luminar)
Lidar L2+ / benefits & use-cases (Robosense)
L3 Edge cases (Valeo): which technology for which edge case
L3 applications (Valeo): OEMs ASIL-D requirements lead to a combination of sensors

## Session 2

SW defined Lidar (Cepton): new Long Range Lidar from Cepton
FMCW (Voyant): Concept for a low-cost FMCW Lidar concept using components from the shelf (synergy with telecom applications)
Lidar Growth (DVN) – The key factors:
Competition btw Vision, radar, Lidar systems
Market requirements and applications: EU, US, CN
Deployments of AVs: maturity of L2/L2+ systems, robotaxis
Safety will be the key to wider adoption, for L2+ as for L3,4
Lidar Standardization activities (fka GmbH) – status in EU,US,CN

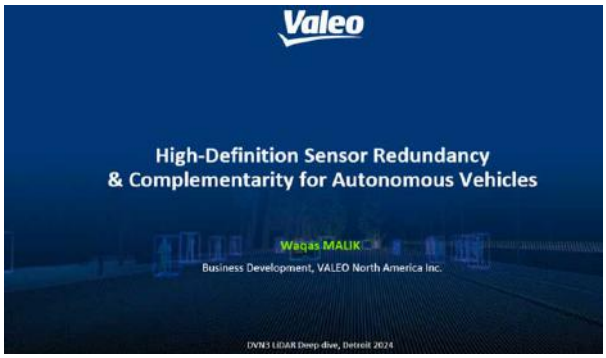
## Main topics discussed during the Break-out sessions:

Markets: Is there spec differentiation between China and ROW ?
NHTSA ruling for Pedestrian detection in the dark: which technology can support?
How to define lidar Range in a standard manner ?
What are some of the packaging constraints and how do you design around it ?
What are the impacts of noise to the consumer (from the Lidar unit)
How do we map use cases to test conditions at point cloud level better ?
Is there something that lidar vendors are looking for cleaning ?

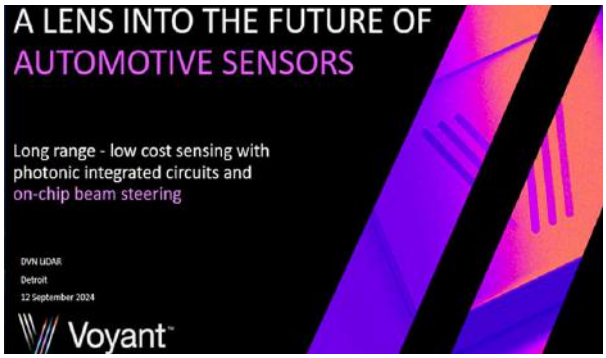
## Presentations


Luminar


Robosense




Valeo




Voyant


Cepton


DVN-Lidar

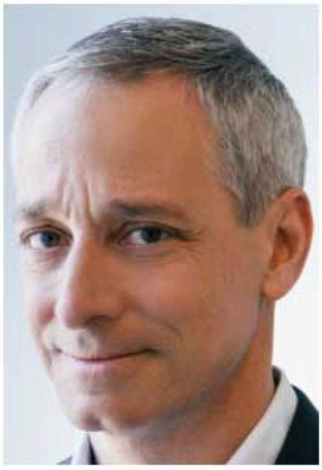

FKA

## Speakers

AARON JEFFERSON
(LUMINAR)

WAQAS MALIK
(VALEO)

SCOTT SKELTON
(ROBOSENSE)



PETER STERN
(VOYANT)

AMOGH SAPKAL
(FKA)

LUIS GONCALVES
(CEPTON)

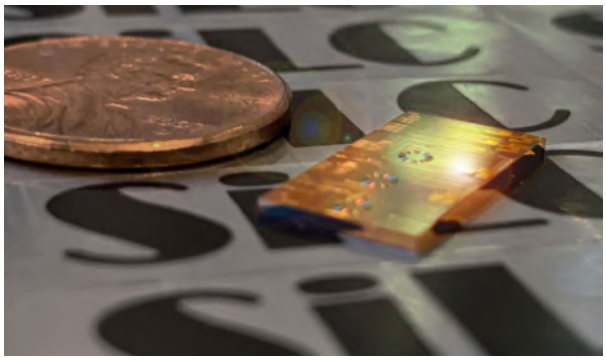
ERIC AMIOT
(DVN-LIDAR)

LIDAR BUSINESS

# Lidar Business Newsbites

| | Aug., 2024 | YTD, 2024 |
|---|---|---|
| **Outputs** | **1,092** | **7,008** |
| BEV | 646 | 4,208 |
| PHEV | 445 | 2,796 |
| FCV | 1 | 4 |
| **Sales** | **1,100** | **7,037** |
| BEV | 646 | 4,216 |
| PHEV | 453 | 2,817 |
| FCV | 1 | 4 |

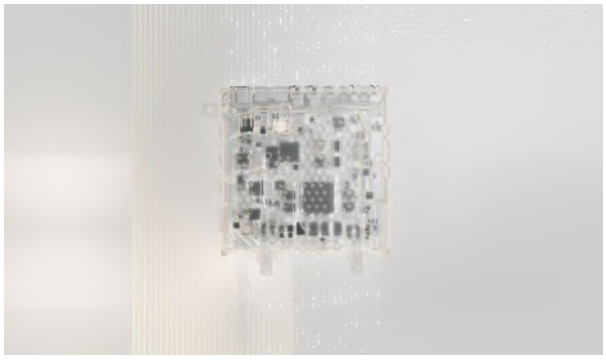
**Chinese NEVs Sell Like Hotcakes**
In August 2024, a total of 1.1 million NEVs were produced in China, a 30-per-cent year-on-year jump. NEVs constituted 44.8 per cent of the 2.5 million auto sales in China last month; the country's year-to-date NEV production volume was 7 million units as of end August 2024, up 29 per cent over August 2023.



**Honda Invests in SiLC for AI Vision Development**
SiLC Technologies has received an investment from Honda to develop integrated, single-chip FMCW lidars for mobility applications. The investment was made through Honda's startup-focused global innovation program Honda Xcelerator Ventures. The latest funding comes less than a year after SiLC introduced four versions of their FMCW lidar-based Eyeonic Vision System, and secured $25m to expand production to support designs for their Eyeonic solutions.


**Vueron Secures Lidar Investment**
Vueron raised $17m in series-A funding, bringing their total accumulated investment to $25m. New investors include Shinhan Venture Investment, T.S. Investment, Industrial Bank of Korea, E&Venture Partners, Quantum Ventures Korea, Woori Financial Capital, JB Investment, and Samho Green Investment. Existing investors Timefolio Asset Management, Korea Development Bank, and Daesung Private Equity also chipped in.


**Xpeng P7+ Shown at Apsara Conference**
Xpeng Chairman-CEO He Xiaopeng showcased the new Xpeng P7+ at the Apsara Conference organized by Alibaba Group. The maker says this car, equipped with 'AI', can 'learn' and anticipate needs autonomously. It includes Xpeng's new-generation 'AI' Hawkeye Vision system with LOFIC (lateral overflow integration capacitor) pixel architecture for better adaptability and clearer, more accurate data collection in various lighting conditions.

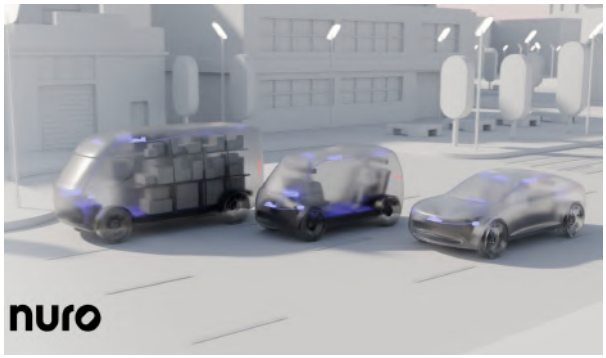


**Volvo Expands Nvidia Partnership**
Volvo Cars is expanding their partnership with Nvidia to improve software-driven Volvos' safety, autonomous driving, and sophisticated in-car experiences. This collaboration will allow Volvo to incorporate Nvidia's 'AI' and computing technologies. Volvo says their dedication to safety and innovation drives their pursuit of integrating in-house development with strategic partnerships.

**Wayve Gets Uber Funds for Self-Driving Tech**
Uber is investing into British startup Wayve, as an extension of the previously-announced $1.05bn series-C funding round. The two companies will work with automakers to integrate Wayve's 'AI' into consumer vehicles which could eventually operate on Uber's platform.


**Uber, WeRide Launch AVs**
Uber and WeRide have announced a strategic partnership to introduce WeRide's AVs to the Uber platform, beginning in the United Arab Emirates later this year; Uber users will be able to choose an AV ride, and it will be in a WeRide vehicle.


**Uber, Waymo Expand Autonomous Rides**
Uber and Waymo have expanded their existing partnership to bring autonomous ride-hailing to Austin, Texas and Atlanta, Georgia by early 2025. Uber will manage and dispatch a fleet of Waymo's electric Jaguar I-Paces, which is expected to grow to hundreds over time. Riders who request an Uber X, Green, Comfort, or Comfort Electric may be matched with a Waymo vehicle for qualifying trips.




**Nuro Expands Autonomous Driving with Licensing Model**
Autonomous-tech company Nuro has announced a shift in their business strategy: they will license their 'AI'-driven Nuro Driver autonomy platform to automakers and mobility providers. The move is aimed at accelerating the adoption of autonomous vehicles, allowing for $L^4$ autonomy in passenger and delivery vehicles.

INTERVIEW

# DVN-L Interview: Joseph Thompson / Valeo Brain NA - Engineering Director

***DVN @ Valeo Innovation Day***

Valeo held its Innovation Day, September 11th, 2024, at its US HQ in Troy, Michigan. They demonstrated a number of new technologies in the areas of Power, Lighting and ADAS.

On the LiDAR side, Valeo demonstrated the Scala 3 smart - for behind grille integration - and the Scala 3 satellite unit - for windshield integration. LiDAR still remains a high-end option today, but as costs come down, it provides coverage for corner cases, like road object avoidance and vision in night condition, plus redundancy versus a camera only system.

The Scala Satellite system uses a separate ECU for point cloud processing and has the capability to do object detection depending on OEM requirements. This also helps keep the power down in the box that sits behind the windshield for thermal design considerations.

Valeo Scala 3 Test in Demo-vehicle


Valeo Modular Central ECU

## *DVN interview with Joseph Thompson / Valeo Brain NA - Engineering Director*

Joseph Thompson leads the ADAS & Interior Experience engineering team for Valeo's Brain division in North America.

He has held leadership positions in automotive engineering and industrial operations management with a focus on innovation and customer service. He holds a degree in Mechanical Engineering.

### DVN: Valeo has a large ADAS products portfolio, could you tell us more about this portfolio and activities?

**JT:** With more than 1.5 billion sensors shipped in the last 30 years, Valeo counts the acceleration of ADAS among its key corporate priorities. In order to successfully achieve this priority, we must be able to replicate or replace complex driving tasks. That starts with sensing the world around us, processing the senses into a set of instructions, and actively learning and adapting from environmental feedback. This combination of sensors, compute units, software, and intelligence is at the heart of Valeo's portfolio.

Our sensor sets include a range of ultrasonics, vision cameras, radars, LiDAR, and most recently thermal cameras. Our compute units range from an entry level 1-box solution and grow to domain controllers and central-compute units, which offer electrical architecture simplification and scalability.

Our software suite includes hardware drivers, silicon-agnostic compute platforms, middleware, and application layers available in embedded or licensed form.

### DVN: What is the competitive position of Valeo ADAS systems in the US, is the large ADAS portfolio a real advantage?

**JT:** Valeo is a leader in the U.S. ADAS market, and with this comes the diversity of sensors, processors, and software already mentioned. If we look at each OEM's approach to ADAS execution, we also see strategic diversity.

While some traditional and new mobility players seek sensor-only or build-to-print compute solutions, others embrace an integrated sensor/compute/perception hardware and software set; still others embrace fully decoupled hardware and software as the industry transitions to the software defined vehicle.

Therefore, in order to address diversity in the market and to complement our customer's strategies, Valeo's current hardware and software strategy is absolutely an advantage to our customers, leading to new contracts, strategic supplier awards and innovations awards, including a 2024 CES Innovation Award for our SCALA 3 LiDAR.

**DVN: US Market, do you see an increasing demand for HD radars, for which applications?**


MID-RANGE RADAR IMAGING RADAR

Radar offers a unique advantage: it "sees" through atmospheric disturbances which are impenetrable by visible light. Radar performance is often quantified by its detection range as well as its ability to distinguish high- and low- radar reflective targets within close proximity to one another. Enter HD or imaging radar for which inquiries are growing in the U.S. market.

As vehicle autonomy increases, the ability to reliably detect and classify low-reflective driving road hazards and high-reflective stationary versus moving objects becomes a key mission. Today, HD or Imaging Radar has demonstrated highly improved detection performance and U.S. inquiries are growing. Valeo offers a complete portfolio of solutions starting with  traditional radar, through mid-range radar, and HD radar.

**DVN: US Market - do you see an increasing demand for Lidars, for which applications. Which Lidar products do you propose?**


SCALATM Gen 3 (Smart) SCALATM Gen 3 (Satellite)

Amid an increasing demand for LiDAR sensors in the US, Valeo’s offering revolves around the SCALA 3 family, Valeo’s 3rd generation LiDAR perception systems available in 2 variants: Smart (with a full-fledge onboard perception stack) and Satellite (roof-compatible slim variants with an off-board perception computing hosted on a dedicated compute ECU provided by Valeo as well).

Our LiDARs offer front or side perception performance matching the needs of both passenger cars and robotaxi players segments.

**DVN: US Market, do you see an increasing demand for the IR cameras, for which applications?**

Wide-FOV RGBIR Interior Camera

Exterior Thermal Camera

There is an increasing level of new business awards and inquiries related to propagation of infrared imaging in automotive. These can primarily be attributed to the need to monitor the state of cabin occupants in order to manage assisted and autonomous driving, the need to detect life presence outside of the vehicle under adverse conditions (eg fog), and the evolving regulatory landscape. Valeo offers two key technologies in the infrared imaging realm including RGBIR (shortwave IR) driver/in-cabin monitoring solutions in a wide-FOV, as well as exterior thermal imaging (long range IR) to achieve these functions.

**DVN: US Market – Waymo is expanding its Robotaxis business, but very slowly. Tesla said it will also go after this market as well. What are the prerequisites to an emerging Robotaxi market, is there a way to get this business profitable?**

The robotaxi business in its pure economic form is primarily about offsetting the cost of driver wages with the cost of energy, maintenance and vehicle depreciation. As wages increase and volumes grow,and companies are able to better utilize their fixed costs, the business case will improve. It is noteworthy that in the U.S. the scale of public transportation is much different than in Europe, and one noteworthy reason is the longer distances which make traditional public infrastructure cost prohibitive. Therefore, there is indeed a problem to be solved in the U.S. While it has not reached wide-scale rollout, Valeo is prepared to help new mobility partners solve their problems and grow the robotaxi business.

**DVN: US Regulation – Which are the critical requirements related to the new NHTSA ruling FMVSS127 – incl. Pedestrian Detection in the dark?**

JT: NHTSA has released a new regulation which has required 100% of passenger vehicles sold in the U.S. as of September 2029 to be equipped with AEB (Automatic Emergency Braking) and PAEB (Pedestrian Automatic Emergency Braking).

While systems exist today which primarily reduce the severity of a collision, the NHTSA rule is unique in that it:

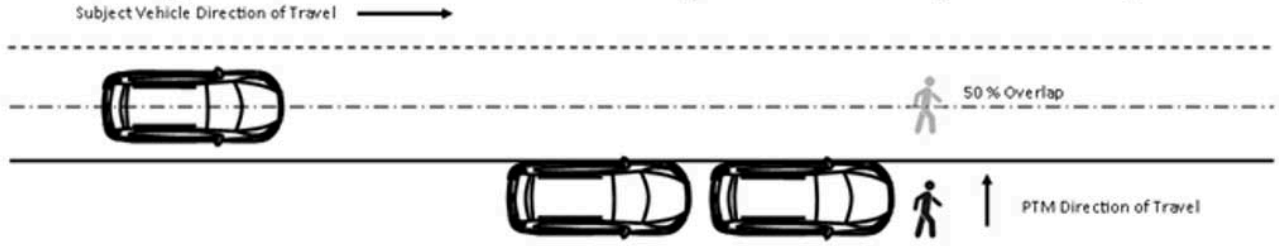
- requires car-to-car collision avoidance up to 100 km/h and mitigation up to 145 km/h
- requires pedestrian collision avoidance up to 65 km/h and mitigation up to 73 km/h
- requires pedestrian collision avoidance in the dark (0.2lux)

These characteristics offer unique challenges, and many in the industry are concerned about coping with "false positives" or the premature application of brakes.

Table 7: Summary of PAEB Collision Avoidance Key Test Parameters

| Scenario | PTM Reference Location | Type | Overlap | Speed (km/h) | | Lighting Condition | |
|---|---|---|---|---|---|---|---|
| | | | | Subject Vehicle | Pedestrian | Environmental Lighting | Vehicle Lighting |
| Crossing Path | Right | Walking Adult | 25% | Any 10 – 60 | 5 | Daylight | - |
| | Right | Walking Adult | 50% | Any 10 – 60 | | Daylight | - |
| | Right | Walking Adult | 50% | Any 10 – 60 | | Dark | Lower Beams |
| | Right | Walking Adult | 50% | Any 10 – 60 | | | Upper Beams |
| | Right | Obstructed, running child | 50% | Any 10 – 50 | 5 | Daylight | - |
| | Left | Running adult | 50% | Any 10 – 60 | 8 | Daylight | - |
| Stationary | Right | Stationary Adult | 25% | Any 10 – 55 | 0 | Daylight | - |
| | | | | Any 10 – 55 | | Dark | Lower Beams |
| | | | | Any 10 – 55 | | | Upper Beams |
| Along-Path | Right | Walking Adult | 25% | Any 10 – 65 | 5 | Daylight | - |
| | | | | Any 10 – 65 | | Dark | Lower Beams |
| | | | | Any 10 – 65 | | | Upper Beams |

Figure 6: Obstructed Pedestrian Crossing Path from the Right Basic Setup

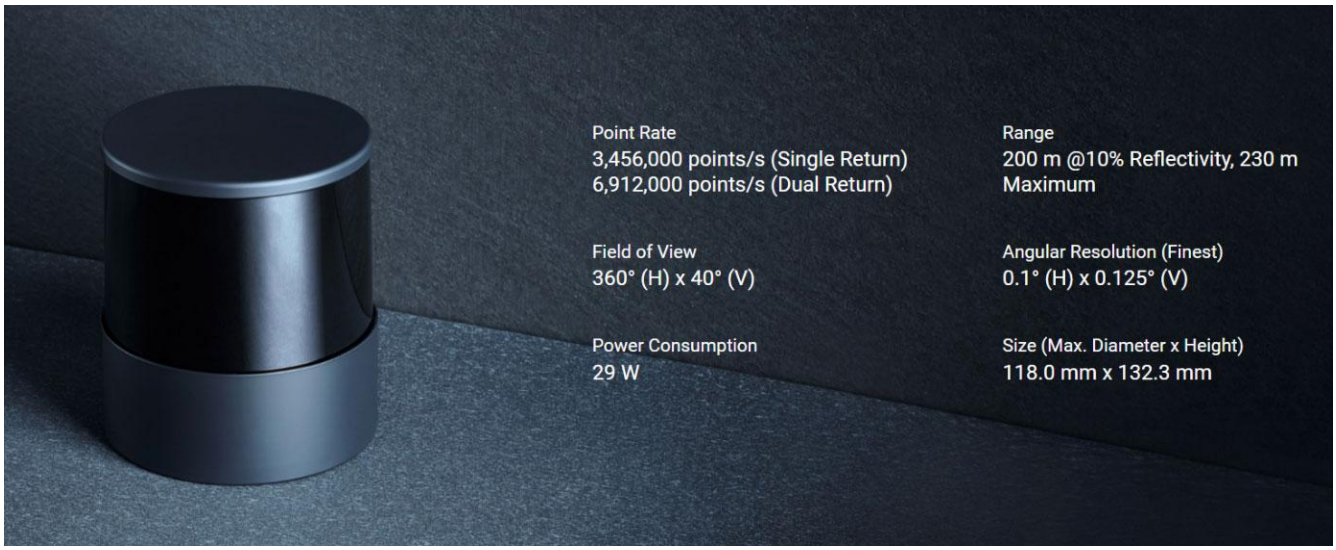



## DVN: US Regulation - Which technologies could support the new NHTSA ruling FMVSS127 – incl. Pedestrian Detection in the dark?

Sensor modalities that "see" in the dark can certainly help support the NHTSA ruling; these are primarily LiDAR, radar, and thermal imaging. Valeo is actively working with OEMs to offer solutions that can scale from entry-level to luxury.

## LIDAR AND IMAGING RADAR TECHNOLOGY NEWS

# Hesai Launches 360° Lidar for L4 AD




Hesai's new OT128 360° lidar sensor is designed for the likes of $L^4$ autonomous driving, industrial robotics, smart ports, and ADAS development. The OT128 pivots from traditional mechanical rotary designs, instead using chip-based architecture for the transceiver modules. This ensures high performance, automotive-grade reliability, and the ability to be mass-produced efficiently.

This is the first time Hesai has applied their VCSEL+SiPM transceiver module to a 360° mechanical lidar, with over 95 per cent of its core components shared with the existing AT128 lidar. The OT128 has 66 per cent fewer components and a 95-per-cent decrease in core manufacturing steps, which means faster production. It offers 360° rotative scanning without the need for multiple units, and a mature, proven design for sturdy reliability.

Performance stats include detection range of up to 230 meters at 10 per cent reflectivity, 3.45 million points per second, and 0.1° angular resolution. The OT128 is already in mass production at Hesai's factory, and companies including DeepRoute, WeRide, and Westwell have selected it for their projects.

### DVN comment

Lidar leader Hesai showed their advanced OT128 lidar at IAA Transportation in Hannover. The OT128 seems the most mature 360° long-range lidar available; surely it will greatly improve AVs' comprehensive sensing capabilities.

## LIDAR AND IMAGING RADAR TECHNOLOGY NEWS

# Aeva Showcases High-Spec 4D Lidar Tech at IAA Transportation


Aeva presented their 4D Lidar technology for the commercial vehicle sector at the IAA Transportation show.
At IAA, Aeva exhibited their FMCW 4D lidar technology, featuring the supplier's own Atlas and Aeries II sensors, which capture both the velocity of each point and precise 3D position simultaneously. More, Aeva showed their latest custom silicon innovations, including their CoreVision lidar-on-chip module and their X1, a robust system-on-chip lidar processor.
Show attendees got to explore the product, witness live demonstrations, and gain insight into its capabilities aimed at advancing safer driver assistance systems and autonomous highway driving. Live point cloud data from Atlas and Aeries II sensors highlighted Aeva's abilities to detect 3D position and velocity simultaneously. And scene segmentation and pedestrian detection features were demonstrated, made possible by Aeva's advanced perception technology.
Aeva partner Torc Robotics, a Daimler Truck subsidiary, showed their driving simulator. Torc aims to bring $L^4$ autonomous trucking to market, starting with the Freightliner Cascadia platform. Attendees got to try out the driving simulator, virtually experiencing an autonomous truck as it navigated complex scenarios using Aeva's 4D lidar sensor data.
There were demo-drive ride-along experiences with live 4D lidar sensor data to showcase the distinct advantages of Aeva's technology, such as simultaneous detection of velocity and range, ultrahigh resolution, and ultralong-range sensing.

### DVN comment

Aeva's 2023 sales reached $4.3m, slightly above the 2022 figure, and the company used about $120m of their cash reserves. Aeva's CEO recently emphasized the importance of the new production agreement with Daimler Truck as validation of their FMCW lidar, indicating the industry's move towards FMCW technology for advanced ADAS and highway autonomy in vehicles. Nikon plans to start series production for their industrial automation solutions by the end of the year. Daimler will adopt the technology in 2026, with a scale-up to potentially hundreds of thousands of units by 2027.

## LIDAR AND IMAGING RADAR TECHNOLOGY NEWS

# Cron, Lumotive Show Solid-State Lidar With Beam Steering Chip


Cron AI, whose specialties include their adaptive 3D edge perception platforms, and programmable optical semiconductor experts Lumotive, have anounced a partnership. The goal is to develop new 3D sensor technology: a solid-state lidar design with integrated deep learning features augmented by Lumotive's Light Control Metasurface (LCM) chip. The idea is to address the limitations of prior systems by combining their strengths into one cohesive design based on Lumotive's 3D Sensing development kits.

These kits facilitate the creation of a system similar to a camera module, featuring a software-defined region of interest (ROI) which supports dynamic extended range, higher frames per second, and high resolution. Object detection and perception layers, such as those from Cron AI, can dynamically control these capabilities.

This LCM-based, 'AI'-enabled sensor surpasses simple camera/lidar combinations. It integrates key camera functionalities like license plate recognition with lidar capabilities such as precise object detection, classification, speed and location tracking, data fusion, and comprehensive environmental data. The deep learning layer then processes this data in real time, generating actionable 'insights' for various applications.

This combined sensor exceeds the capabilities of traditional mechanical lidar and camera systems, delivering cost-effective, top-tier performance in a compact package.

The two companies say this approach can benefit autonomous vehicles and V2X, intelligent transport systems and the Vision Zero initiative; crowd and people management (with real-time monitoring and analysis for security, safety, and space optimization), and smart cities and security.

### DVN comment

Lumotive's award-winning programmable optical semiconductors boost perception and computing power, and ensure reliable high-speed communication across industries. Their LCM chip, a software-defined photonic beamforming technology, addresses key demands in sectors like 3D sensing and AI computing.

## LIDAR AND IMAGING RADAR TECHNOLOGY NEWS

# Mobileye Stops Lidar Development


Mobileye, an Israeli company responsible for numerous advancements in automated driving technology will close their lidar development unit by the end of the year, lurching about 100 employees.

Mobileye had been developing FMCW lidar, which can be miniaturized to chip size and can detect both the position and speed of objects around a moving vehicle, but now say they consider FMCW lidar less critical for their eyes-off-the-road autonomous drive systems: "This decision was influenced by several factors, including significant progress with our EyeQ6-based computer vision perception, increased clarity on the performance of our internally developed imaging radar, and continued unexpected cost reductions in third-party time-of-flight lidar units".

Silicon photonics also played a role in Mobileye's previous lidar development plans. CEO and founder Amnon Shashua outlined these efforts during a keynote at CES in 2021, saying FMCW lidar would be implemented by 2025. This approach stemmed partly from earlier silicon photonics research at Mobileye corporate parent Intel,  aimed at making lidar chips encompassing both active and passive optical elements.

Instead of merging inputs from cameras, radar, and lidar sensors to view the dynamic environment around a moving vehicle, Mobileye's strategy has been to create two separate viewing channels—one generated by the camera suite and the other from a mix of radar and lidar data.

Ahead of the expected introduction of FMCW lidar, the company stated they will use Luminar's sensing systems for robotaxi applications. Mobileye has been investing around $60m annually in lidar research, out of a total company development budget of around $1bn. They said the pivot won't affect any customer product programs or general product development, and reaffirmed their dedication to the development of their in-house imaging radar, which meets performance specifications based on B-samples and is scheduled to enter production next year as planned, adding "imaging radar remains a strategic priority. This foundational technology is expected to provide a competitive edge for Mobileye-based eyes-off systems through the optimisation of cost/performance and scalability".

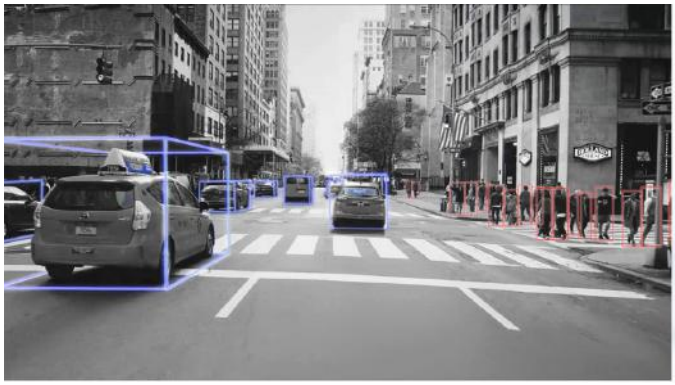
### DVN comment

FMCW lidar offers advantages over conventional direct-detect lidar, including:
• Improved range resolution, enabling the measurement and separation of multiple closely spaced surfaces.
• Improved dynamic range, enabling the measurement of both bright and dim objects simultaneously.
• Single-photon sensitivity, enabling small apertures, long range operation, and obscurant penetration.
• Velocity sensitivity, enabling the ability to detect and quantify motion.

The development resources required for FMCW technology are quite costly, which is one reason why MobilEye has opted to focus on conventional ToF lidars instead.

## GENERAL TECHNOLOGY NEWSBITES

# Mobileye Imaging Radar Takes the Wheel



Traditional ADAS radars work well in simple environments, but struggle with static object detection, and advancing to higher autonomous-drive capabilities poses challenges with reliability and accuracy. To address these, the industry seeks solutions prioritising safety for passengers and pedestrians. Achieving safe autonomous driving is generally understood to require additional sensing beyond just cameras. Mobileye's True Redundancy approach uses lidars and a new category of imaging radars to create an independent sensing state, improving road safety and autonomous features.

Mobileye's imaging radar has been specifically developed for autonomous driving. This advanced imaging technology offers a higher dynamic range than conventional radars in difficult situations, like detecting a child 150 meters away when a bus is only 10 meters from the vehicle.

In contrast to traditional radar systems with limited object detection capabilities, Mobileye's imaging radar provides more detailed object detection with enhanced elevational resolution. This precise detection allows the system to identify objects in unique scenarios, such as stationary vehicles under a bridge. It produces a rich point cloud that aids AV driving capabilities, including accurate lane assignment and rapid reactions at high speeds. The system can detect road users—pedestrians, motorcycles, and cyclists—up to 350 meters away and recognize potential hazards as far as 230 meters.

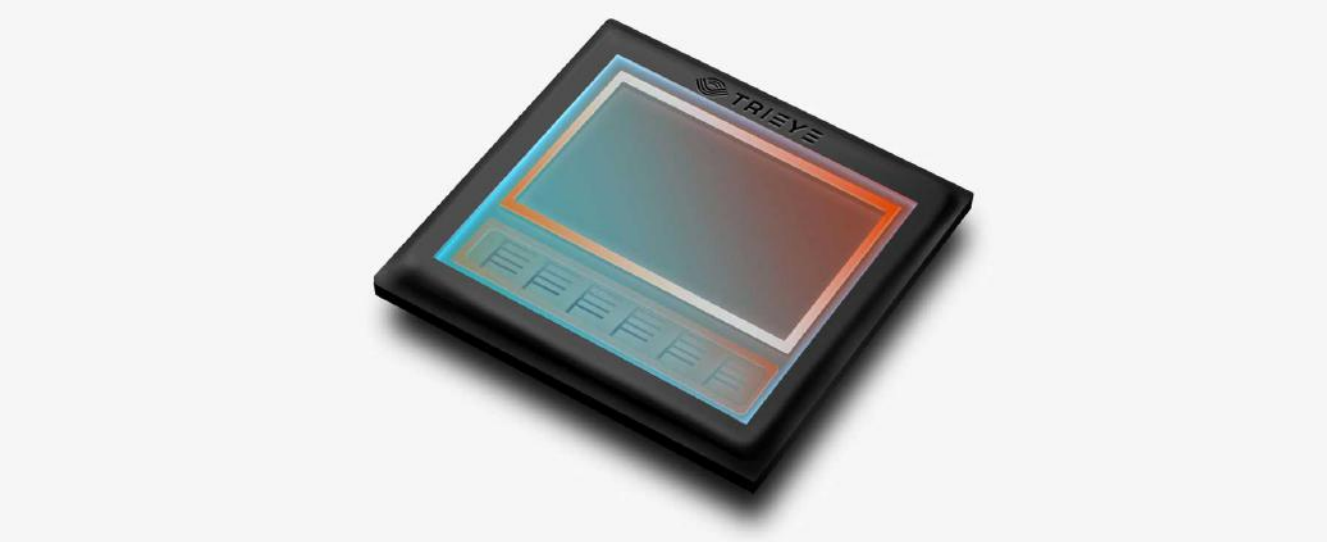
The automotive industry is undergoing significant changes in radar technology to improve current systems. The Mobileye radar portfolio offers high angular resolution, wide dynamic range, and excellent sidelobe suppression, which helps detect small and low-reflective objects on highways at speeds up to 130 km/h.

DVN comment

Mobileye and Valeo announced last year a new partnership for software-defined imaging radar. Through this partnership, the two companies could be able to propose this type of 4D imaging radar to the world's automakers, for L3 AD vehicles.

GENERAL TECHNOLOGY NEWSBITES

# TriEye's High-Res SWIR Sensor




TriEye, maker of the world's first cost-realistic mass-market shortwave infrared (SWIR) sensing technology, has now announced their new TES200, a 1.3-megapixel SWIR image sensor. Based on TriEye's CMOS image sensor technology, it is the first commercially available product released in the Raven product family.

The TES200 operates in the 700-to-650 nm wavelength range. It offers large format, high frame rate, low power consumption, and unusually great sensitivity and dynamic range.

TriEye's Raven image sensor family is designed for emerging machine vision and robotics applications, incorporating the latest SWIR pixel and packaging technologies. The TES200 is immediately available in sample quantities, and for production orders with delivery in Q2 2025.

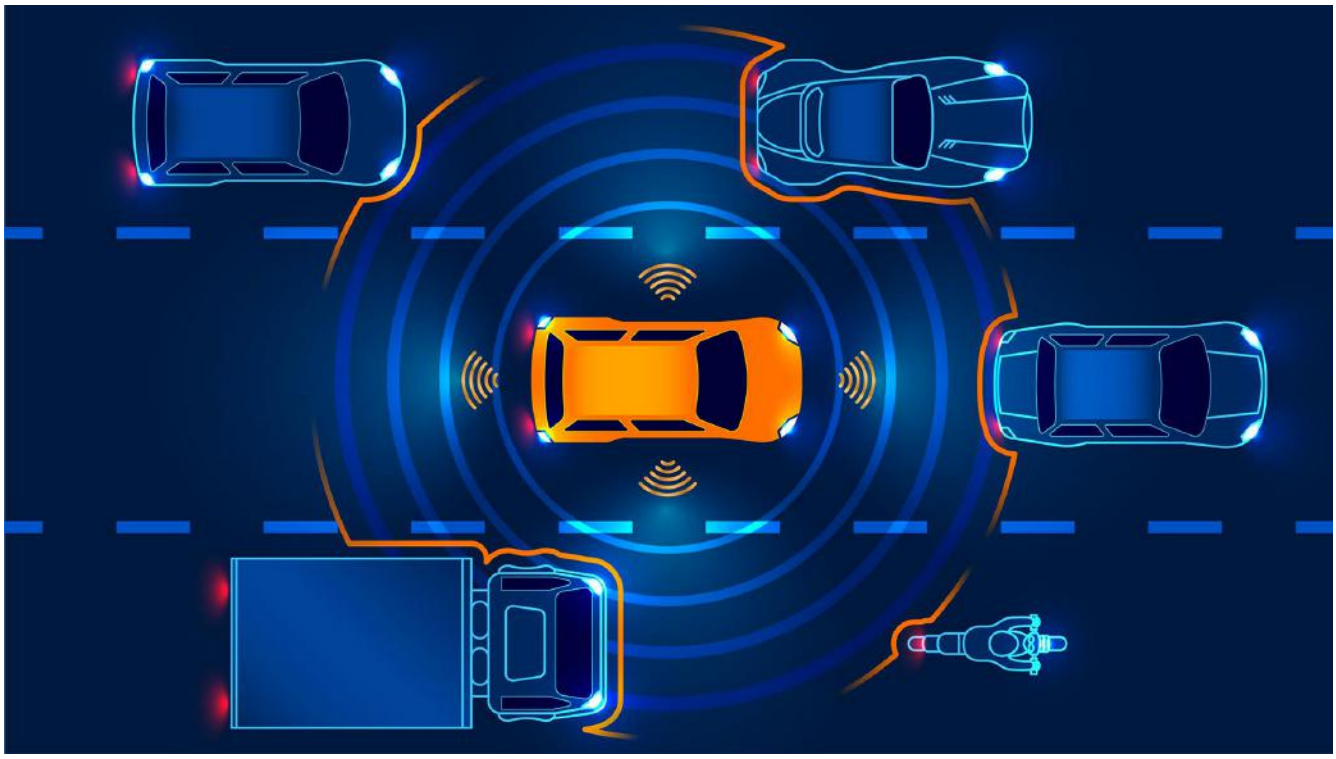
Based on advanced academic research, TriEye's breakthrough technology enables HD SWIR imaging and accurate deterministic 3D sensing in all weather and ambient lighting conditions. The company's semiconductor and photonics technology enabled the development of the SEDAR (Spectrum Enhanced Detection And Ranging) platform, which allows perception systems to operate and deliver reliable image data and actionable information, at much lower cost than general industry rates.

DVN comment

TriEye has attracted major investors like Intel and Porsche, who joined the supplier's series A fund-up in 2019. The latest funding round, led by M&G Investments and Varana Capital, included Samsung Ventures, Deep Insight, Allied Group, and existing investors Intel Capital, Porsche Ventures, Marius Nacht, and Grove Ventures. This round brings TriEye's total funding to $96m.

AUTOMATED DRIVING

# AD Newsbites



**Cruise Resumes Bay Area Testing**
Cruise is launching manual mapping vehicles in Sunnyvale and Mountain View, California to augment their AV technology. Later in the fall, the company will start supervised testing with up to five AVs in the area. This initiative is vital as Cruise works with California regulators and local communities to rebuild trust and improve their self-driving technology—and to let local Cruise employees to interact directly with the product.

**Mercedes Drive Pilot Top Speed Rises**
Mercedes-Benz is reworking their Drive Pilot $L^3$ ADS to support speeds of up to 95 km/h on German highways. The upgrade, set to roll out in early 2025, will be offered free of charge to existing customers. The system remains priced at €5,950 for new customers, including tax. This will make Drive Pilot the world's fastest $L^3$ system in a series-production vehicle.

### XPeng X9 Variant Has Two Lidars, Guided Pilot Tech

The new Xpeng X9 610 Max has been launched in China. Unlike the base model, the 610 Max features two lidar sensors to enable XPeng's Navigation Guided Pilot (XNGP), which the maker calls some of the most advanced self-driving technology on the market. The decision to add lidar is in contrast to Xpeng's decision to put a pure-vision system on their new P7+, following Tesla's notorious refusal to use lidar. The X9 610 Max starts at C¥379,800 (~$54,000)

### Ji Yue 07 Orders Open, With Baidu Apollo $L^4$-Capable Self Driving Tech

Ji Yue, the automotive brand build by Baidu and Geely, has released version 2.0 of their software. It is set to debut in the Ji Yue 07, which started pre-sales at the same time—priced from C¥215,900 (USD $31,000). The highlight of this software upgrade is the transition from PPA (point-to-point autopilot) to ASD (Apollo Self Driving) 'intelligent driving', which signals Ji Yue's venture into the era of end-to-end large models for advanced vision-based smart driving makes them the world's first auto brand to implement Baidu's Apollo ADFM $L^4$ autonomous driving large model—the only such brand in China, and one of two in the world to achieve this level of high-level visual-only autonomous driving capability.

### Planzer, Loxo Launch Autonomous Delivery Vehicle in Europe

Planzer and Loxo have announced the first autonomous $L^4$ commercial vehicle operating in Bern, Switzerland. Called Planzer – Dynamic Micro-Hub with Loxo, the idea is to revolutionize city logistics by using Loxo's digital navigation system. Over a two-year pilot period in Bern, the project aspires to cut emissions, streamline delivery routes, and illustrate the future of sustainable urban transport.

**WeRide Starts Paid-Ride Robobus Operation in China**

WeRide, in partnership with Hengqin Guangdong-Macao authorities and Zhuhai Da Heng Qin Technology Development, has launched the first commercial autonomous shuttle buses in Hengqin. The company received approval to conduct regular road tests of robobuses without safety operators or steering wheels, under remote high-level autonomous driving conditions, paving the way for fully unmanned operations.

**Ontime Starts Commercial Robotaxi Operations**

Ontime, the mobility service platform supported by GAC Group, received approval to demonstrate 'intelligent' connected vehicles in the Hengqin Guangdong-Macao Cooperation Zone. By 31 December 2023, their robotaxi fleet had reached 281 vehicles, becoming the largest among Chinese ride-hailing platforms, with 20,080 operational hours, 545 pick-up/drop-off locations, and 450,699 kilometers of safe test operations.

**Lynk & Co Z10 Allowed for $L^3$ Road Tests**

Lynk & Co has obtained an $L^3$ autonomous driving test license for their Z10 car in Wuxi, Jiangsu Province. The Z10 achieved a flawless score across five categories and numerous test scenarios during the licensing test. The Z10 is available in five variants, with promotional prices ranging from C¥ 196,800 to 288,800 (USD $28,000 to $41,000).

**Pony Starts Testing AVs on New Guangzhou Expressways**

Pony.ai, holders of the first ICV expressway testing permit in Guangzhou, has started autonomous driving tests on the region's eight new expressways, totaling about 158 kilometers. Currently, Guangzhou has 933 testing roads open, with a total one-way distance of approximately 1,980 kilometers, including over 260 kilometers of expressways, leading the nation. Pony received their ICV expressway testing permit this past May.

**Monet AVs Arrive in Tokyo**
Money Technologies, a joint venture involving SoftBank, Toyota, and other Japanese companies, will soon introduce an autonomous mobility service in Tokyo Waterfront City. This service will use $L^2$ self-driving technology, wherein a human driver must be present and vigilant, ready to take control as needed. Two Toyota Sienna minivans will be used, with a maximum speed of 40 km/h (25 mph).

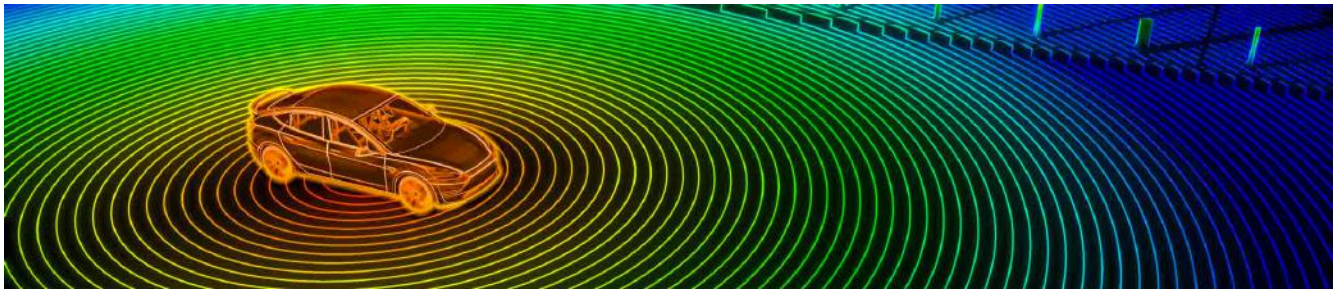

**Isuzu Seeks $L^4$ Launch**
Isuzu is partnering with Applied Intuition to roll out $L^4$ models in Japan and North America by late this decade. Facing a driver shortage and new work-hour limits in Japan, Isuzu has invested $30m in US-based Gatik to develop an autonomous truck chassis, aiming for a 2027 launch.

**KargoBot, Hengtongyuan in JV for $L^4$ trucking**
Cooperation between KargoBot and Hengtongyuan aims to advance the application of $L^4$ autonomous trucking convoys in trunk logistics across Xinjiang and the broader Northwest region of China.

KargoBot has developed an innovative convoy system targeting large-scale logistics in regions with fixed routes and high demand for cost reduction and efficiency improvements. In October 2023, KargoBot started regular operations on multiple routes in Xinjiang. As of this past August, KargoBot's autonomous convoys have accumulated over 8.2 million kilometers of operation, and have transported 55 million ton-kilometers of cargo, significantly surpassing industry benchmarks.

**LIDAR CONFERENCE**

# DVN-Lidar Conference Docket · 18-19 November, Wiesbaden



## Monday, 18 November: Lidar Applications; Ecosystem

**11:20-12:45 REGISTRATION AND LIGHT WELCOME LUNCH**
TEST Democars: Robosense, Seyond, Valeo, Vueron

**12:45-13:55 OPENING the Conference by DVN CEO (Paul-Henri Matha)**
START-UPs Pitch New Technologies forAVs: VOYANT, LIDWAWE (tbc)
**KEYNOTE 1:** FORD - Peter Zegelaar LiDAR's essential role in highway automated driving
**KEYNOTE 2:** VALEO - Joachim Mathes (tbc) AV Sensors for a safe L2+/L3 driving

**13:55-15:00 SESSION 1 - LIDAR APPLICATIONS 1**
HYUNDAI MOTORS - K.C.Kweon
LYNK& Co (tbc)
AGC Wideye – Raed Elmakhour
STELLANTIS (tbc)
**Q&A**

**15:00-15:20 COFFEE BREAK 1 + TEST DEMOCARS**

**15:20-16:25 SESSION 2 - LIDAR APPLICATIONS 2**
CONTINENTAL- Wolfgang Schultz
FRAUNHOFERILT - Arnold Gillner
CEPTON - Henri Haefner
GRVA/UNECE- Francois Guichard
**Q&A**

**16:25-16:40 COFFEE BREAK-2**

**16:40-17:45 SESSION 3 - LIDAR ECOSYSTEM**
SCHOTT- Maximilien Glanzer
DEXERIALS - Ryosuke Endo
YOLEGroup - Pierrick Boulay
FKA GMBH - Amogh Sapkal
**Q&A**

**17:45-18:10 DISCUSSION PANEL I**
*Lidar Growth and Safety Benefits, the keyfactors*

**18:10-20:00 SOCIAL COCKTAIL + TEST Democars**

**20:00 WELCOME DINNER (Conference Room)**

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## Tuesday, 19 November: Lidar Technology; AV Sensors & Fusion

**07:00-08:30 BREAKFAST in Hotel**

**08:30-09:00 KEYNOTE-3:**
ROBOSENSE - speaker (tbd)

**09:00-10:10 SESSION 4 – LIDAR TECHNOLOGY 1 / Sensors**
SEYOND- Oliver Ramoli
HESAI - Tilman Gasche
SCANTINEL- Stanislav Aksarin
INNOVIZ - Efrat Rotem Lavi
**Q&A**

**10:10-10.50 COFFEE BREAK 1 + TEST DEMOCARS**

**10:50-12:00 SESSION 5 – LIDAR TECHNOLOGY2**
TRIOPTICS- Dirk Seebaum
SCRAMBLUX - Mirvais Yousefi
**Q&A**

**12:00-13:45 LUNCH & NETWORKING+ TEST DEMOCARS**

**13:45-14:50 SESSION 6 – LIDAR COMPONENTS**
AMS OSRAM - Clemens Hofmann
SUNA OPTEC - speaker (tbd)
RENESAS- Leonard Germic
SONYSEMI CONDUCTORS (tbc) - Alexis Vander Biest
**Q&A**

**14:50-15:30 COFFEE BREAK 2 + TEST DEMOCARS**

**15:30-16:35 SESSION 7 • AV SENSORS & FUSION, SW TOOLS**
ANSYS-OnSemi - Pascal Auger
VUERON- Shino Yoon
VANJEE - Zhai Zhao
ZKW (tbc)
**Q&A**

**16:35-17:00 DISCUSSION PANEL II**
*Affordable Lidars & Safe L2+/L3 driving*

**17:00-17:15 CLOSURE (PROGRAM DVN 2025)**