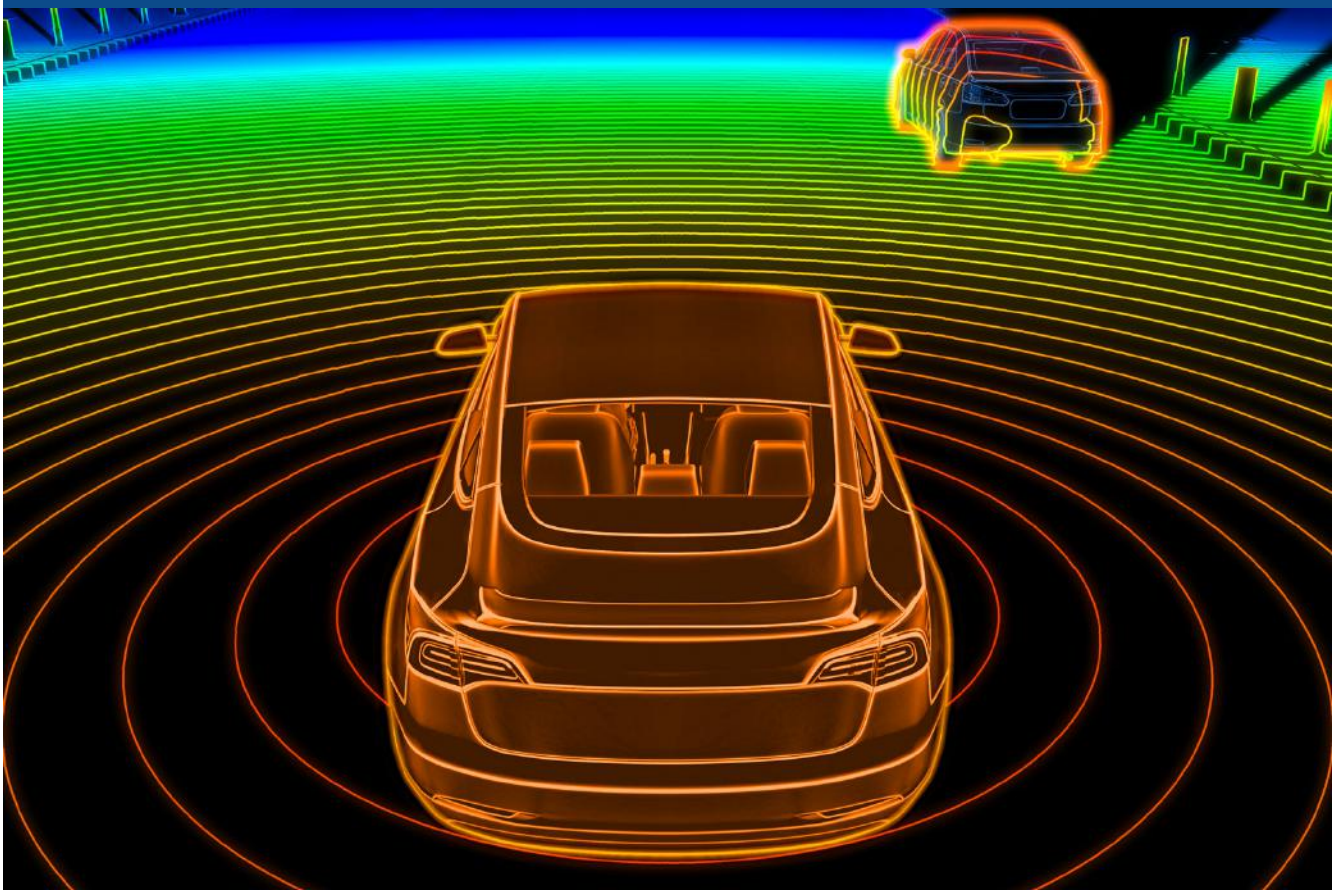
DVN
Lidar

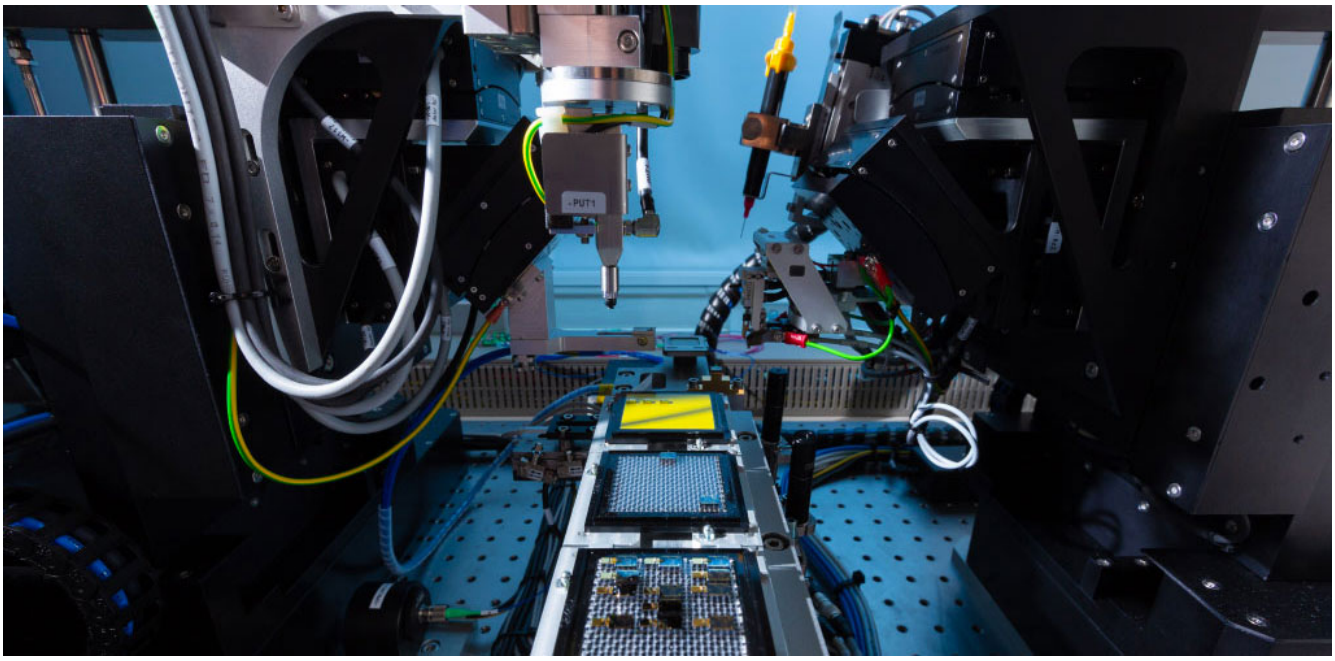
Monthly newsletter #20

NOVEMBER 1, 2023



EDITORIAL

Lidar Production: Upward and Upward!



Automotive lidar volumes are growing exponentially, and efficient manufacturing technologies are a major driver of that happy trend. So this month's issue of your DVN-Lidar Newsletter focuses on rising lidar production and equipment rates; innovative technology and technique, and fresh application ideas. We also bring you an interview with a knowledgeable industry expert, who shares his thoughts on the effect of weather conditions on lidar performance, and its coexistence with other systems.

Technical competition is another force vector driving the evolution of vehicular lidar, and so you'll read about a special kind of camera which gives lidar a run for the money.

And we've got the final list of speakers of our 6th Lidar Conference, to be held 29-30 November in Wiesbaden. You'll want to register as quickly as you can; this is a unique event with the whole lidar industry gathering in one place to talk and listen with each other and showcase the latest breakthroughs.

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

All best,

Alain Servel

DVN LIDAR ADVISOR

LIDAR BUSINESS

Business Newsbites

In the first three quarters of 2023, China added 5.2 million new energy vehicles to its roads, a 40-per-cent increase year/year. These accounted for **28.6 per cent of all newly registered cars** in the same period, with 1.4 million units in the first quarter; 1.7 million in the second quarter, and 2.05 million in the third quarter. By the end of September this year, China's NEV fleet had grown to 18.21 million—5.5 per cent of the total on-road fleet, including 14.01 million pure electric vehicles, or 76.9 per cent of the total new energy vehicle count.

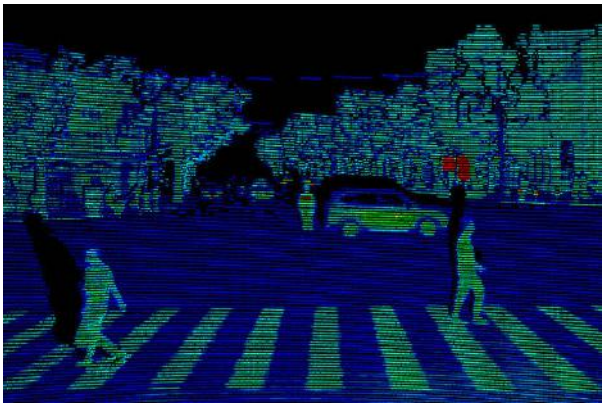
In collaboration with Chery, Huawei's new auto brand Luxeed is set to launch a first model in November, the S7. It is positioned as a 'high-performance, spacious, intelligent sports sedan' and features Huawei's new HarmonyOS 4 system, along with 'advanced intelligent driving technology'. The S7 is said to offer a spacious interior, an exhilarating driving experience, and extended range. There's also a Lidar mounted on the roof.

Robocar maker Ji Yue introduced China's first instantiation of 'BEV+Transformer Pure Vision' technology co-developed with Baidu. The system, which relies on cameras only, is operational on the roads of Shanghai, and uses dual Nvidia Drive Orin chips. Ji Yue developed a solution that combines vision with lidar assistance. Now, with rapidly advancing AI visual algorithms, the 2.0 phase purportedly 'eliminates the need for lidar' and gradually reduces reliance on high-precision maps.

Robosense hit a new record this past August by delivering over 20,000 automotive lidar units in a single month, surpassing their previous achievement (in June) of nearly 10,000 units. Robosense now has partnerships with 21 automakers and tier-1 suppliers, and there are 58 production vehicle models equipped with Robosense lidars as of June. As of the end of August, the company has already equipped 14 car models.

Hesai was nominated as the lidar supplier of Neta Auto's upcoming vehicle model. The partnership will see Neta's new vehicles equipped with Hesai's AT128 long-range lidar system, with an expected rollout in the first half of 2025. Since it went into mass production in 2022, the AT128 has been deployed onto multiple high-end passenger vehicle models, with a cumulative delivery volume of more than 130,000 units.

Shenzhen-based lidar maker LSlidar (Leishen Intelligent System) recently secured hundreds of millions of yuan in their D-round funding. The funds will be directed towards furthering the development of domestic lidar technology and product replacements, R&D of their 3D SLAM autonomous forklift technology and applications, and construction of an automated factory for 1550-nm optical fiber lidar and a 3D SLAM autonomous forklift base.



The U.S. International Trade Commission has closed their investigation of patent infringement initiated by Ouster against Hesai. The ITC's decision backs their earlier (August) ruling.

Luminarhas completed their inaugural run-at-rate production test for Volvo Cars in advance of the launch of the new EX90. This significant step was taken at Luminar's high-capacity manufacturing hub situated in Monterrey, Mexico.

Nodar (as in 'no lidar') is a company of specialists in stereo vision technology for AVs. They say their product sets new standards in 3D sensing, especially in long-range accuracy, nighttime operations, and bad-weather performance. The company says their technology outperforms lidar, in that it can pinpoint a 10-cm object from 150 meters away.

INTERVIEW

DVN-L Interview: FKA's Adrian Zlocki on Automotive Lidar Standards

Adrian Zlocki has been in charge of automated driving activities at FKA since 2012. Before that, he headed the company's coöperative AD activities with Rheinisch-Westfälische Technische Hochschule Aachen University, where he obtained his PhD in automotive engineering. His experience in the field goes back at least as far as 2004, and he enthusiastically shared his insights and thoughts with us.

DVN: FKA is an engineering and testing provider for ADAS and AD systems. What can you tell us about the company and your activities?

Adrian Zlocki: For more than 35 years, FKA has been an innovative engineering service provider for research and development tasks for the automotive industry and its suppliers. As a spinoff from the Institute for Automotive Engineering (IKA) at RWTH Aachen University, it was founded in 1981 by Professor Jürgen Helling. His most important goal was to act more independently from public research funds and continue working in an academic and scientific manner, putting more emphasis on an industry-oriented and practical approach with a focus on its key topics: efficiency, safety and driving pleasure.

FKA provides the full range of engineering services for its worldwide customers, which include conception and simulation, as well as design and engineering of prototypes, and their experimental testing. Flexibility, an adherence to schedules and the highest level of cost and quality awareness play an important role at the same time. The chassis, body, drivetrain, electrics-electronics, and automated driving departments collaborate closely with the cross-section strategy & consulting, acoustics, vehicle concepts, thermal management, and user experience & performance departments to achieve efficient and accident-free driving pleasure, by optimizing and cross-linking subsystems and vehicle components.

FKA puts the focus of its activities on pre-development and integration tasks for single components and complete systems, as well as holistic inspection of the vehicle with its multiple interplays. Moreover, FKA engages with the domains of training and specialization, offers courses for various research focuses, and is also the organizer of renowned conferences.

ADAS and automated driving is one of FKA's core business units. Since the introduction of first ACC systems at the end of the 1990s, FKA is active in testing ADAS sensors and functions. FKA is involved in many public and private research projects with strong focus on testing and safety assessment and assurance methodology.

DVN: What are typical FKA research projects and customers?

A.Z.: Customers of FKA are the overall automotive industry. We work for OEMs and suppliers not only in Germany and Europe, but also in the USA and in Asia. FKA operates an office in California—FKA Silicon Valley—to work closely with the AD and tech companies there. Most of FKA's work is on a bi-lateral basis with specific customers on specific research questions.

FKA is also partner—or linked third party with the Institute for Automotive Engineering of RWTH Aachen University—in various publicly-funded projects. Within these, FKA usually develops methodologies. Examples are the German funded PEGASUS project, in which FKA developed the first concepts for a scenario database for safety assurance of automated driving, and the current Hi-Drive project in which FKA will demonstrate cross-border automated driving and develops processes for harmonised road testing on a European level, and the Code of Practice for automated driving.

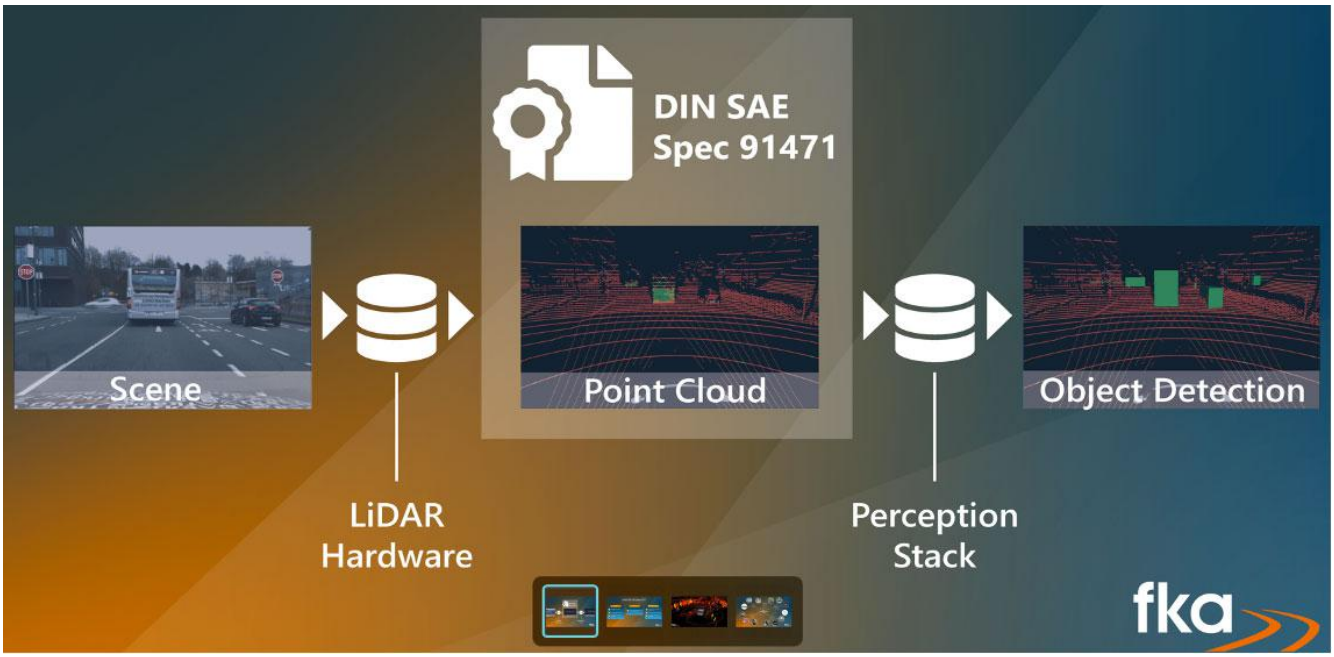
As for sensors, FKA undertakes projects with OEMs and tier-1s as well as lidar manufacturers to develop methodologies for testing. The goal is to provide customers with standardized testing procedures as well as offering the tools to test scenarios which are tailored to customers' specific needs. FKA also tests sensors in physical tests on the proving ground.

DVN: Are you taking part in European or nationally-funded research projects as a significant part of your activity?

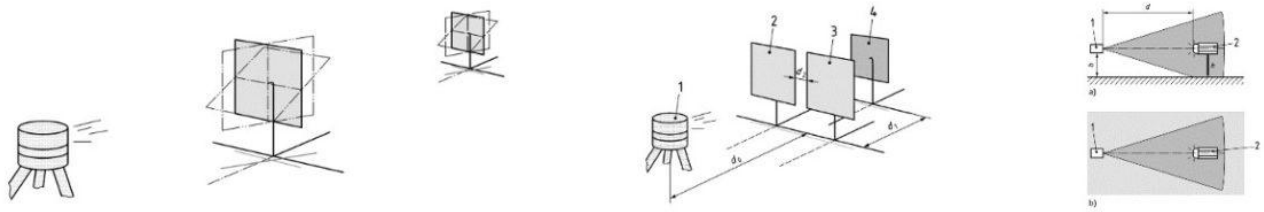
A.Z.:FKA's lidar activities were initially developed within the PROMETHEUS project at the end of the 1990s, the first European-funded project on vehicle intelligence. For current lidar projects, external funding on a national or European level is not foreseen. Instead, the idea of collaboration between different partners is applied. Basically, FKA formed a group of industry partners to reach the project goal. In this group, every project partner contributes to the final results of the activity.

DVN: Last year, FKA created an industry consortium to develop the first DIN specification for lidar performance assessment, which was published this past April. Tell us about that, won't you?

A.Z.: DIN SAE spec 91471 describes a basic assessment methodology for automotive lidar sensors for external environment sensing. It consists of common sensor specification and characterization guidelines and a common and application-relevant evaluation framework, which includes test scenarios, key performance indicators and evaluation tools. The spec is publicly available for free and can be applied by sensor manufacturers, car manufacturers, and test houses such as FKA. This specification is technology-agnostic, meaning it should work for any type of automotive lidar sensor on the market. Although the focus is on mid- and long-range lidars, the specification can be easily applied to short-range lidars as well. This requires a slight change in the parameters such as target sizes and distances to targets.



Extract of Test Set-ups



DVN: Creating standards is a priority to show lidar is a mature technology, so what are the next steps?

A.Z.: In DIN SAE spec 91471, the boundary conditions are ideal: no weather influences, no dirt or any other influences are foreseen in the test scenarios so far. This does not reflect automotive reality. In the next project, the goal is to focus on adverse conditions. The next project includes three adverse conditions: weather (rain, fog, snow); contamination (dust, dirt, road spray), and interference (lidar vs. lidar, lidar vs. light, etc.).

DVN: Are you aware of other activities like this in the world?

A.Z.:Certainly! lidar performance assessment is currently in focus of many activities. There is an ISO activity ongoing, ISO/PWI 13228. Hopefully the DIN SAE spec provides a good basis for all considerations on the ISO level. Adverse conditions are not part of the ISO activity, and therefore are complementary. Furthermore, the ISO timeline is different from FKA's project.

On the SAE level there is also strong interest to focus on lidar assessment. We are aware of these activities and collaborate with SAE in order to not re-create what already exists.

There are also standardisation activities pertaining to lidar sensors that cover other aspects such as laser safety, functional safety, network security, and SOTIF. Our focus, however, remains on performance evaluation of lidars, although we do keep an eye on these activities as well.

In research, there are several projects on the EU level focusing on sensor performance assessment. We closely monitor the output of these projects and offer our expertise. We certainly are open to any discussions and want to share our experience and knowledge as far as possible.

LIDAR AND IMAGING RADAR TECHNOLOGY NEWS

RoboSense Ships 20,000+ Lidar Sensors a Month

RoboSense has proudly announced they delivered over 20,000 automotive lidar units this past August—breaking the domestic record for monthly lidar shipments in the automotive sector. Having achieved a milestone of nearly 10,000 units in June, RoboSense accomplished an extraordinary feat in August by doubling their monthly sales. This achievement signifies a remarkable accomplishment, with monthly sales surpassing half of the total sales for the entire previous year.

Founded in 2014, RoboSense's RS-lidar-M1 is the world's first mass-produced solid-state lidar. Mass production and delivery began in June 2021. At the end of that year, RoboSense entered a supply partnership with BYD. Toyota is also among the automakers with which RoboSense has lidar supply partnership agreements.

In 2022, mass production began of the upgraded RS-lidar-M1P lidar. 2022 sales of the standard and -P models totalled up to 40,900 units.

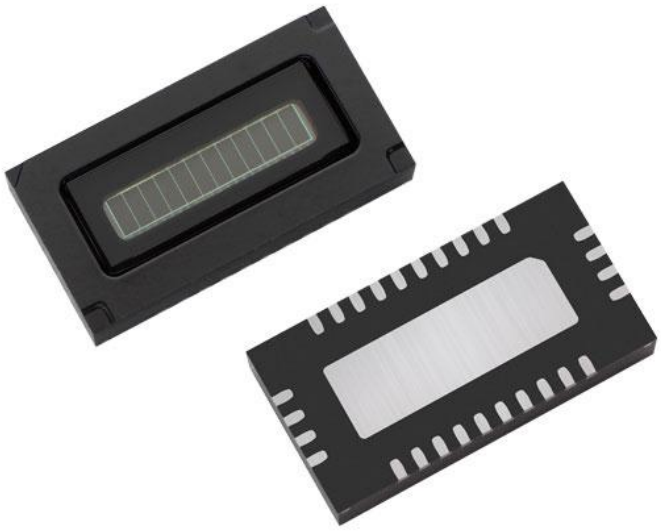
As of March 31, 2023, RoboSense had received expected orders for 52 models of lidar from 21 car companies and tier-1 suppliers. Nine models have already started production.

DVN comments

Robosense's automaker customers include Ford, Xpeng, Lotus, GAC Group, SAIC, and BYD.

LIDAR AND IMAGING RADAR TECHNOLOGY NEWS

Onsemi SiPM Sensors Goose Automotive Lidar Performance

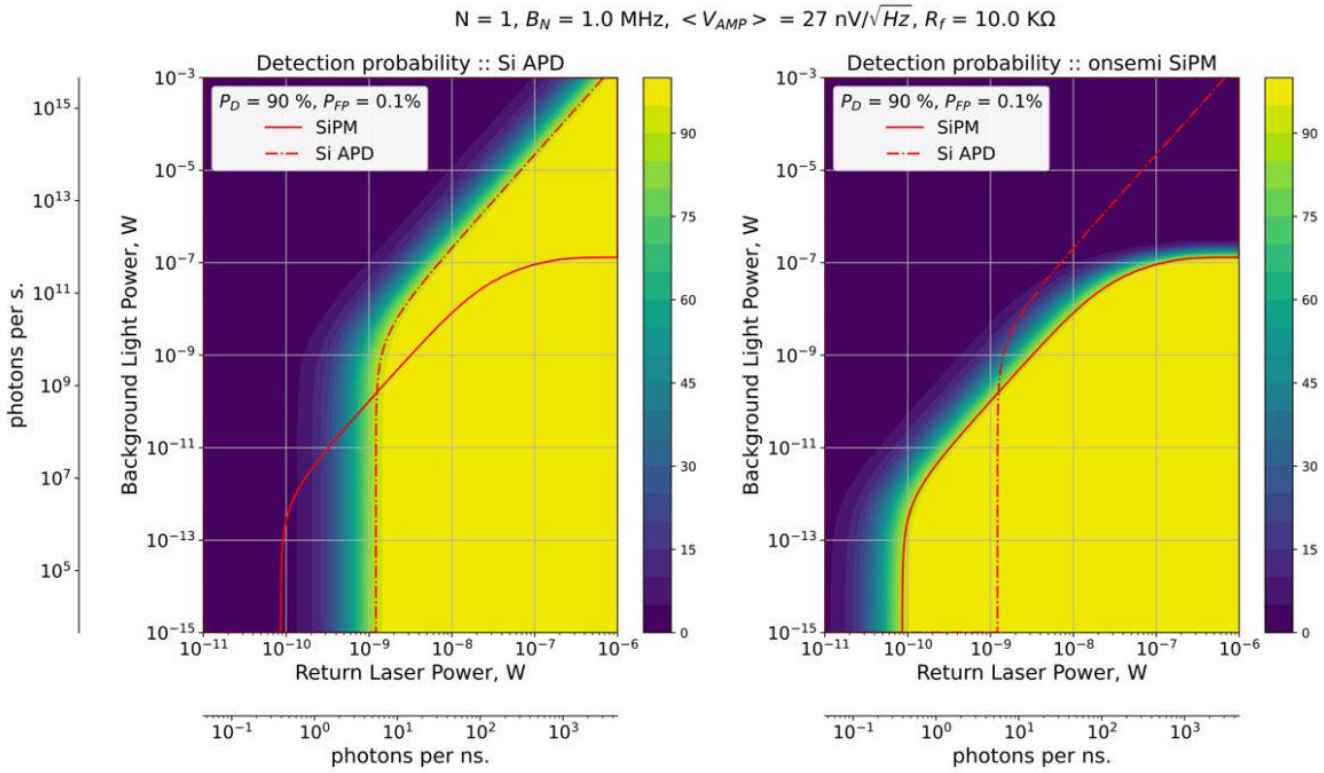


Silicon photomultipliers (SiPM) are highly efficient light sensors that confer single photon detection capability on the receiver. SiPM-based lidar offers a remarkable signal-to-noise ratio (SNR) advantage over other kinds of sensors, such as avalanche photodiodes (APD). A SiPM's high internal gain and fast response time allow higher detection probability of low-reflectivity targets at long distances. This significant improvement is achieved without the need to increase the outgoing laser power requirement, thereby reducing system power requirement and thermal management burdens.

Furthermore, this better SNR is achieved using a smaller aperture—a smaller optical lens—to maximize light collection, compared to the wider aperture required by APD. This means the physical system size can be reduced, which is helpful where constraints apply to the physical design and dimensions of the lidar system, a perpetual condition in vehicle applications.

Other SiPM benefits include low operating voltage and low sensitivity to temperature. These are especially important in automotive applications where the lidar environment can be >85°C. SiPMs are based on standard silicon processes that enable low-cost device production with excellent device uniformity. These benefits can help simplify the lidar design complexity while maximizing performance and reducing cost.

Comparing the relative performance of APD- and SiPM-based lidar systems, with a common set of system-level requirements, shows the operating voltage of SiPM is significantly less than that of APD; device-to-device performance is uniform, and bias voltage variation with temperature is typically 25 mV/°C. Due to its high internal gain, the performance of the SiPM-based lidar system is much less dependent on readout electronics performance. The SiPM readout can accommodate two orders of magnitude more electronic noise compared to the APD readout. And with four orders of magnitude higher gain, SiPM system can work at a much higher bandwidth; this allows more precise depth calculation and increased scanning speed. Thanks to single photon sensitivity, a SiPM-based system requires—on average—one order of magnitude less return laser power to reach the same detection probability as an APD-based system. This improved detection capability can lead to increased ranging capability or decreased laser power requirement, or a mix of both.



Detection probability as a function of background light and laser return power calculated for Si APD (left) and onsemi next generation SiPM device (right) lidar systems. The red threshold shows the detection probability of 90 per cent with false positive probability of 0.1 per cent for SiPM and APD based lidar systems.

A typical requirement is for the lidar to operate under 100k lux, corresponding to the ambient light level on a bright sunny day. Due to its high sensitivity, the SiPM sensor may be saturated if exposed to very high light levels. This would be a problem if saturation due to ambient light prevented detection of an object. The SiPM-based system can be designed to operate under 100k lux ambient conditions by employing a narrow bandpass filter combined with a small aperture lens and a narrow angular field of view. These design solutions align well with existing trends in lidar system requirements i.e., miniaturization (small lens diameter) and high angular resolution (small angular FoV per SiPM).

	APD	SiPM
Gain	Moderate (linear)	High (Geiger)
Responsivity	~10^2 A/W	~ 10^6 A/W
QE/PDE	> 50 %	< 30%
Excess noise factor	4	1.3
Bias voltage	High	Low
Temperature sensitivity	High	Low
Sensor to sensor uniformity	Low	High
Sensor cost	Low	Low
Ambient light tolerance	High	Low
Frontend readout complexity	Higher	Lower

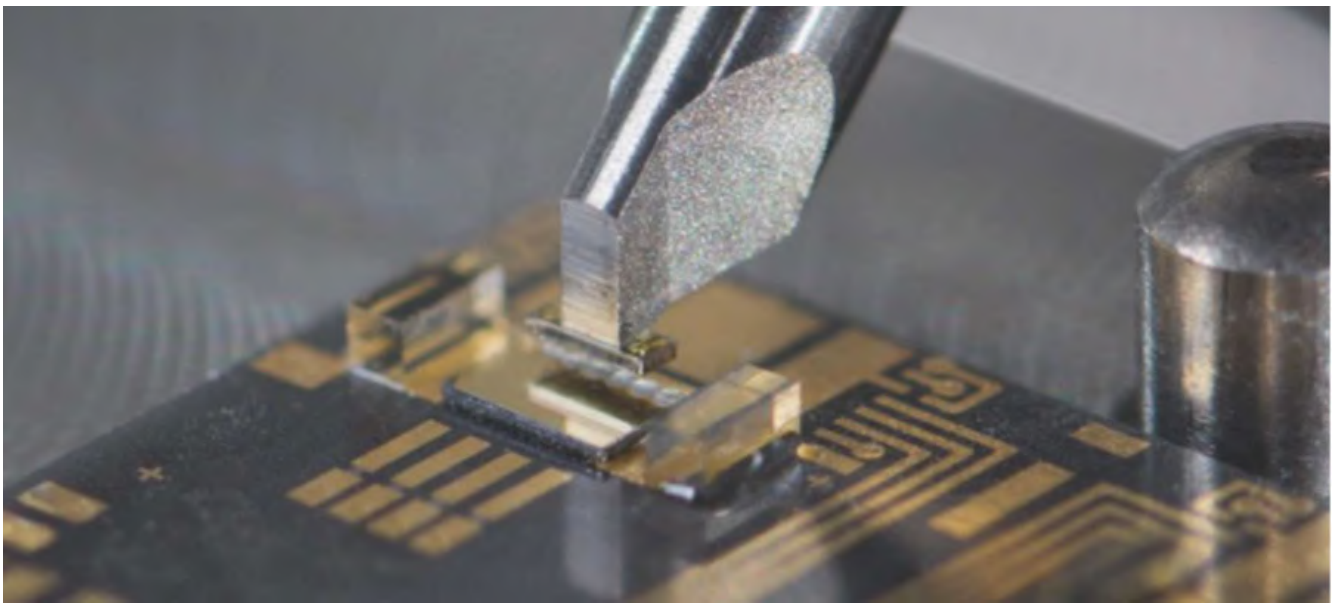
Comparison of typical APD and SiPM lidars

DVN comments

SiPMs are capable of detecting low intensity signals of individual photons so they offer high sensitivity, making them suitable for applications requiring accurate detection of low light levels. Other advantages are high temporal resolution, wide dynamic range, low operating voltage, compactness and robustness, and relatively low cost. These advantages make it an attractive technology for a lidar's receiver stages.

LIDAR AND IMAGING RADAR TECHNOLOGY NEWS

Ficontec's Machines Go to Work on Automotive Photonics



The automotive sector is undergoing two, maybe three major transitions at the same time: the electrification of the drive system, the implementation of automatic safety systems based on vicinity and hazard awareness, and ultimately the introduction of autonomous vehicles at various levels of transport.

Near-term, sensing systems are being integrated in much greater numbers into vehicles. These feed into the many driver assistance and safety systems now available—gesture sensing, pending hazard assessment, object recognition systems, automatic lighting adjustment, rangefinders for active cruise control, and more.

Many of these devices are photonics-based; they use detectors, cameras, optics, LEDs, and lasers. They contribute vital interior and exterior ‘awareness’ data as well as environmental information not only to the vehicle, but also to the building database of knowledge required for the development of autonomous vehicle systems. At the same time, these devices must be readily integrable to vehicles without significantly disrupting vehicle manufacture or crowding out a vehicle's principal features—cost, space, range, and the like—so they must also be light, compact, and efficient.

Ficontec's machines already provide the full gamut of capabilities required to assemble, package and test such devices, wich capabilities including:

- photonic device assembly for camera modules and emitter-detector devices
- LED array and laser module assembly for exterior lights and sensor systems
- hybrid device assembly for VCSEL and fiber optic array coupling
- combined electro-optical mixed signal testing
- diode laser and photonic device characterization and verification

These increasingly complex and miniaturized photonic devices and integrated circuits perform advanced optical functions, such as routing, (de)multiplexing switching of optical signals, sensing, and data communications. Devices include silicon photonics components, 3D sensor and lidar assemblies, photonics-enabled medtech devices, MEMS/MOEMS, miniature lasers, HPLDs and fiber pump modules, hybrid assemblies, LED print heads, high-power LEDs, optical communication devices, and many more.

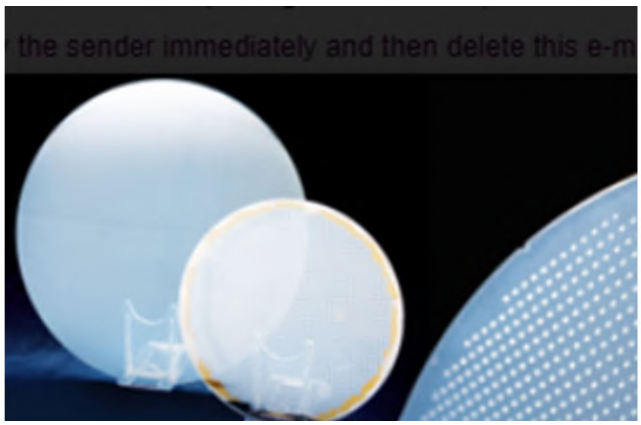
The system checks to see if full optoelectronic functionality meets specifications. The accumulated data is written to an SQL database, providing the user with the necessary statistical analysis and feedback so that, for example, yield can be tracked and improved. The system allows full component tracking and sorting when equipped with a handling system.

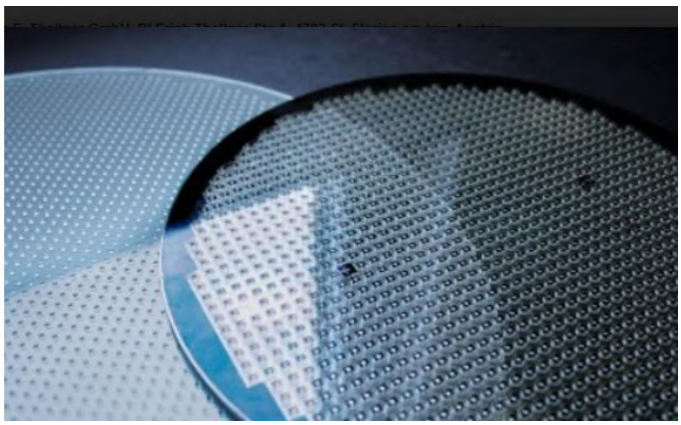
DVN comments

Automated assembly and testing of optical systems offers many benefits, including increased productivity, reduced costs and improved quality of finished products. This also allows greater flexibility in the design and manufacturing.

LIDAR AND IMAGING RADAR TECHNOLOGY NEWS

EVGroup-Delo Wafer-Level Optics Revolution In the Works





EVGroup and Delo will soon publish a paper on wafer-level optics manufacturing. The process involved could successfully demonstrate an excellent lens shape fidelity starting from the very first imprint, as well as excellent reliability, made possible by careful matching of materials and process. As a consequence, they can now provide their customers a working total solution from machine to materials to start their wafer-level optics business. This process and the material used are specifically in the interest of the automotive industry.

The technology involves polymer refractive microlenses serving as the central component in microöptical modules. The primary manufacturing technique employed is UV lens moulding at the wafer level. Unlike other lithography methods, which have constraints in manufacturing complex optical structures at the wafer level, nanoimprint lithography (NIL) and lens moulding are not constrained by shape or complexity, making them ideal for large-scale production.

A topical **webinar is scheduled** for 21 November; it will answer questions including:

- How can reliable microlens production be achieved on a 200-mm wafer?
- How does this lead to high, optical-grade surface quality and shape accuracy?
- What are the key features of EVG's latest multifunctional nanoimprint lithography systems?
- What benefits do the latest Delo optical materials bring?
- How easily can WLO and nanoimprint lithography production be shifted from 150- to 300-mm wafers?

DVN comments

this paper introduces an established industrial solution considering both the process and materials necessary for producing high-quality lenses. This solution ensures outstanding and consistent pattern accuracy throughout the entire fabrication process.

LIDAR AND IMAGING RADAR TECHNOLOGY NEWS

Nodar Stereo Camera Boosts AD Sense Range

A bicycle or pedestrian crossing the road, stopped vehicles, and debris are among the navigational challenges driverless autonomous vehicles must be able to sense and respond to, day or night, and in any weather condition. Software company Nodar is developing a camera-based solution they say provides better-than-lidar target identification, and at further distances.

CEO and cofounder Leaf Jiang started working with lidar at MIT's Lincoln Laboratory more than 13 years ago. Now he thinks a two-camera solution provides better 'vision' for autonomous driving and ADAS. His COO and cofounder Brad Rosen says over the next decade he expects there will be a quarter of a billion L^3 cars on the roads: "At the heart of all of those vehicles is the perception system, and really at the core of that is always going to be vision systems. Cameras are going to be a part of this. So we've doubled down on cameras, and we think that cameras are the way to deliver self-driving cars into the future".

Nodar's software solution, the Hammerhead product line, provides any-object detection with long range and high-resolution 3D data. It offers vision at more than 1,000 meters, can detect objects as small as 10 cm at 150 meters, and something like an upturned motorcycle at 350 meters.

Jiang says Nodar provides a combination of untethered stereo cameras, auto-calibration, and object detection with precise and reliable depth sensing and scene analysis—even at night and in low-visibility weather conditions.

One way of triangulating distance to everything in a scene is by comparing the left and right images. However, cameras are very sensitive to relative alignment. Nodar provides software that keeps cameras aligned no matter the distance they are spaced apart.

Rosen points out that there are two-camera systems that are already in the market, such as Subaru's EyeSight driver assist technology. But the cameras in that system are close together. Wider camera placement, he says, is more advantageous, but with that comes the challenge of keeping them perfectly aligned. Nodar virtually aligns the cameras in software, which is enabled by Nvidia processors "and the incredible camera technology that has evolved and our patented algorithms", says Rosen. "We untethered the cameras and we can mount them pretty much anywhere on the car".

Nodar does not provide the cameras; their software is compatible with off-the-shelf cameras. The recent launch of their GridDetect completes the package and makes the dot cloud of data more presentable to the end user. GridDetect uses single processing and algorithms instead of artificial intelligence; Jiang says an AI approach requires training a system, while algorithms do not have to be trained. He says that means the system can better recognize unique objects, versus an AI system having been trained to detect specific objects.

Rosen says GridDetect provides ultra-precise, long-range sensing able to detect a 10-cm object at 150 meters; a 12-cm item at 172 meters, and a tire at 250 meters.

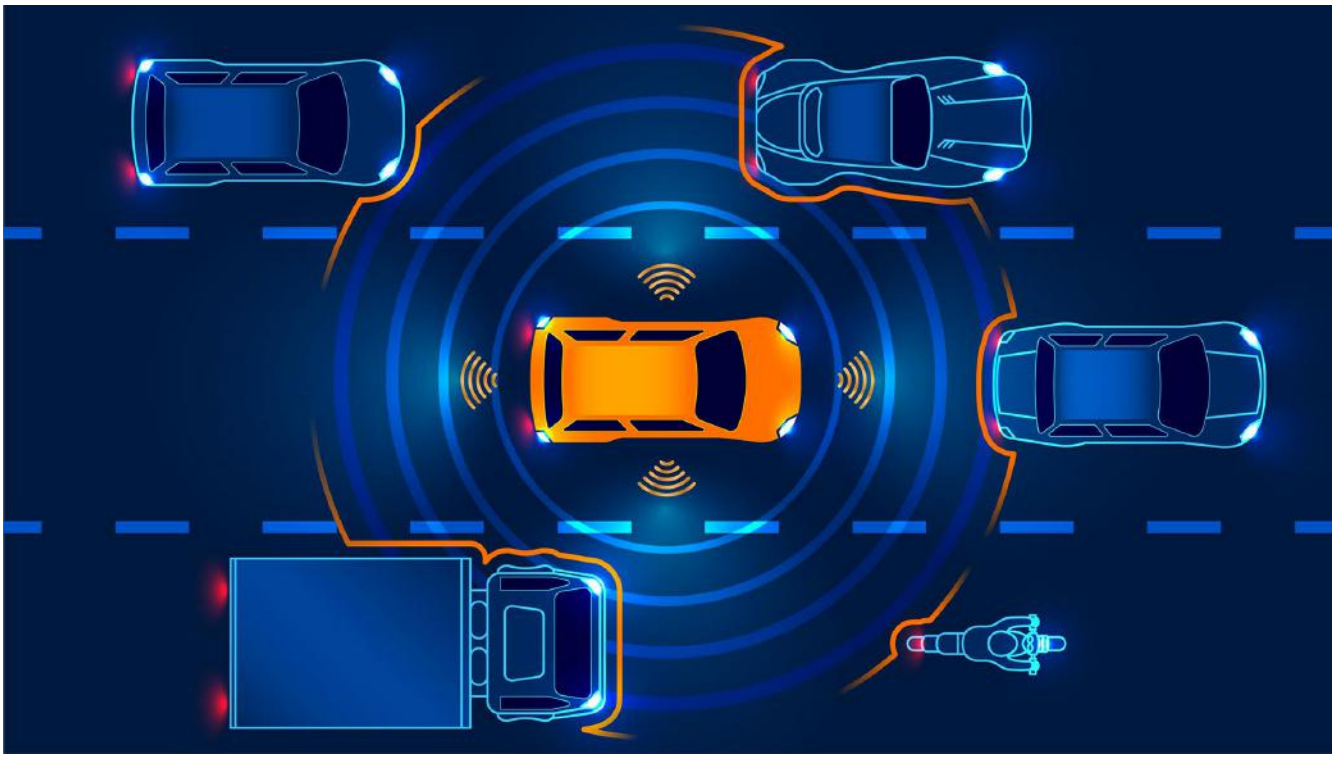
Nodar rented an airport for testing to make sure the 'roadway' was flat. They checked to see if the system could pick up 10 different objects at varying distances. The smallest, a 12-cm target, was recognized by GridDetect at 172 meters. GridDetect picked up larger objects, like traffic cones and cars, at 500 meters.

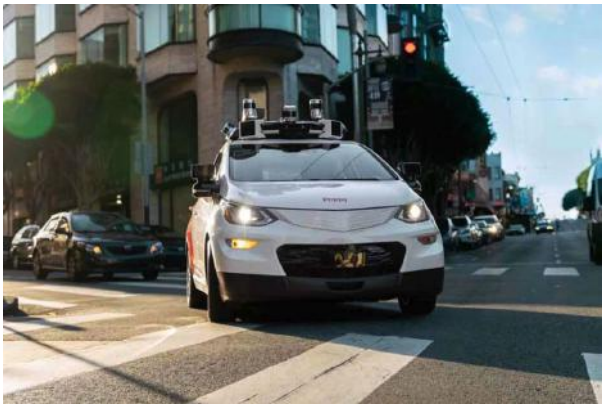
DVN comments

Stereo vision offers three-dimensional perception, high precision, robustness, low cost, flexibility, and real-time processing capability. These advantages make it a competitive technique for environmental perception in many applications, including autonomous vehicles & robotics. In the past, the deployment of such solutions for L2 AD systems, was hindered by a limited stability of camera alignment during the life of vehicle. Camera resolutions enhancements and new auto-alignment algorithms seem to have solved this problem. What of bad-weather situations, though? Time will tell!

AUTOMATED DRIVING

AD Newsbites





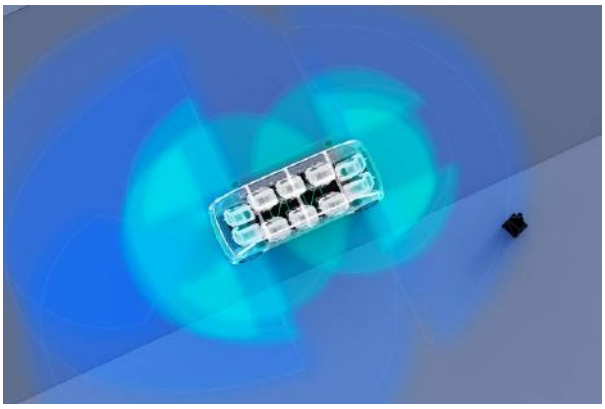
California has suspended Cruise's driverless-car permit, halting the GM self-driving car subsidiary's robotaxi operations in San Francisco just months after it began. A human driver hit a pedestrian, knocking her into the path of a Cruise robotaxi which stopped overtop of the pedestrian, then decided the road was clear and started forward, dragging the woman along underneath. Additional fuel was added to the controversy by Cruise allegedly providing California with video (from a nearby business' security cameras) edited to end after the Cruise car stopped, but before it dragged the pedestrian.

Shanghai has established an impressive network of test roads for autonomous driving vehicles, which includes 926 routes covering 1,800 kilometers, placing the city at the forefront of national development. Smart highways are another significant achievement, with a focus on routes like the G15, S32, and G60. Shanghai is diligently working to create unique C-V2X application systems on these routes, bringing new dimensions to modern transportation.

Beijing Public Transport Corporation, along with Yizhuang's operating company, Foton AUV, and QCraft, secured an intelligent connected vehicle road test permit from the Beijing High-level Automated Driving Demonstration Area (BJHAD). Additionally, they obtained a road test license from the Beijing Traffic Management Bureau. Notably, this marks the first autonomous driving road test license for large public buses in Beijing, signaling the transition from closed-course testing to real-world public transit scenarios.

KargoBot, DiDi's autonomous freight solution, received a notice for road testing of their factory-assembled L^4 autonomous trucks in the Beijing High-level Automated Driving Demonstration Area. Differing from other autonomous driving companies, KargoBot employs a hybrid intelligent operation mode. A human driver operates a lead vehicle equipped with L^2 advanced driver-assistance systems (ADAS), guiding multiple L^4 autonomous trucks to enhance logistics efficiency across various complex scenarios during short, medium, and long-haul routes.

The Beijing High-level Automated Driving Demonstration Area (BJHAD) recently released a notice regarding the airport highway test roads and test areas. Chinese autonomous driving solution provider WeRide, has taken the lead in obtaining qualifications to test autonomous vehicles on the demonstration zone's high-speed roads. Today, within the 225-square-kilometer core area of Beijing's Yizhuang district, citizens can download the WeRide Go App and summon fully autonomous Robotaxis, reaching various destinations like subway stations, central business districts, and large office parks.



TIER IV, who specialize in in open-source AD technology, has achieved L^4 certification for their 'AI Pilot' system. The certification was obtained at the GLP ALFALINK Sagamihara, a vast logistics campus in the Greater Tokyo area. This accreditation aligns with the stipulations of the Road Transport Vehicle Act. TIER IV intends to realize the Japanese Government’s vision of establishing more than 50 driverless service locations in Japan by 2025, and doubling that figure by 2027.

The J.D. Power U.S. Robotaxi Experience Study indicates a prevailing hesitation among consumers towards the testing and introduction of robotaxis on urban roads. With feedback gathered from both robotaxi riders and those who’ve merely observed them in action (non-riders), the study underscores that only 27 per cent of non-riders feel at ease with these AVs on their roads. Even more telling, only 20 per cent of the national consumer base is comfortable with AV technology being examined in their vicinity.

Cruise, GM, and Honda have announced their intent to launch a driverless ride-hail service in Japan by early 2026. The service will feature the Cruise Origin, an AV co-developed by GM and Honda. While the initial focus will be central Tokyo, the companies aim to expand their reach beyond, contingent upon regulatory approvals. Initial testing is slated for next year, laying the groundwork for a commercial offering by 2026.

Horiba Mira is spearheading the Certus initiative alongside key partners Polestar, IPG Automotive, Connected Places Catapult, and Coventry University. This venture aims to streamline and economize the testing of AD systems. The auto industry has been incurring massive expenses, with billions of Dollars (Euros, Pounds, Yen, Yuan...) spent annually on testing AD systems. Certus aims to provide a solution by targeting a 40-per-cent reduction in these costs.

Ford has received approval in Spain to introduce BlueCruise, their cutting-edge driver assistance system. This expansion follows the system's successful launch in Great Britain and Germany, bringing hands-free driving to even more European customers. Over 260,000 Ford and Lincoln vehicles worldwide are equipped with BlueCruise, with users having driven more than 200 million hands-free kilometers.

In response to the growing number of pedestrian fatalities in the US, Teledyne FLIR is joining forces with Ansys to work on enhancing ADAS and AV systems with integrated thermal imaging, aiming to augment vehicle perception in adverse weather and light conditions. 7,508 pedestrians were killed in the U.S. by cars and drivers in 2022; 77.1 per cent of these fatal hits happened after dark.

Cruise has teamed up with The University of Michigan Transportation Research Institute (UMTRI) to present a pivotal study to establish a safety benchmark for human driving. The study involved collaboration involved General Motors and the Virginia Tech Transportation Institute (VTTI), and shows certain advanced vehicle technology can reduce collisions by 65 per cent, reduce primary-contributor accidents by 94 per cent, and cut accidents leading to significant injury by 74 per cent.

Maersk and Kodiak Robotics have launched the first commercial autonomous trucking lane between Houston and Oklahoma City. The freight lane marks an expansion of the collaboration between Kodiak and Maersk, which began with their first autonomous freight deliveries together in November 2022 as part of Maersk's Global Innovation Center Program. Kodiak has been delivering eight loads per week, with a safety driver behind the wheel, for Maersk customers since August.

LIDAR CONFERENCE

DVN Lidar Conference 2023 at Wiesbaden: Final Program

Day 1 · Wednesday, 29 November (Applications; Ecosystem)

11:30 Registration and light welcome lunch

13:00 Opening of conference by DVN CEO & keynotes
Valeo / Benazouz Bradai (Director Innovation Autonomous Driving)
Optica / Olga Raz (Director of Technology for Optics/Optical Systems)

Session 1: Lidar Applications I
Stellantis, Torc Robotics, AEVA, Continental

Session 2: Lidar Applications II
ZKW, Scantinel, FKA, Fraunhofer

16:00-16:30 Coffee Break

Session 3: Lidar Ecosystem
Yole, ACG Wideye, Canatu, Chasm

Plenary Discussion Panel I: “The Lidar Growth Engine”

18:45 Social Cocktail

20:00 Welcome Dinner

Day 2 · Thursday, 30 November (Technology; Manufacturing Process; Software Tools & AI)

07:30 Breakfast

08:30 Opening of conference & Keynote
Hesai / Bob in den Bosch (Sales VP of Global Sales)

Session 4: Lidar Technology I
Microvision, Cepton, Opsys, SOS Lab

10:15-10:45 Coffee Break

Session 5: Lidar Technology II
AMS Osram, Hamamatsu, Vertilite, Süss Micro-optics

12:00-14:00 Lunch

Session 6: Lidar Technology & Manufacturing Process
Elmos-Mechaless, Sony Semiconductor, Ficontec/Scramblux, Jabil, Trioptics

Session 7: Software Tools & AI
Ansys, Dekra, Deepen

Plenary Discussion Panel II: "Affordable Lidar & Validations"

17:00 Closure

Demo-cars: Valeo & Microvision

To register and see the full program, use the following link: DVN Lidar Conference