DVN
Lidar

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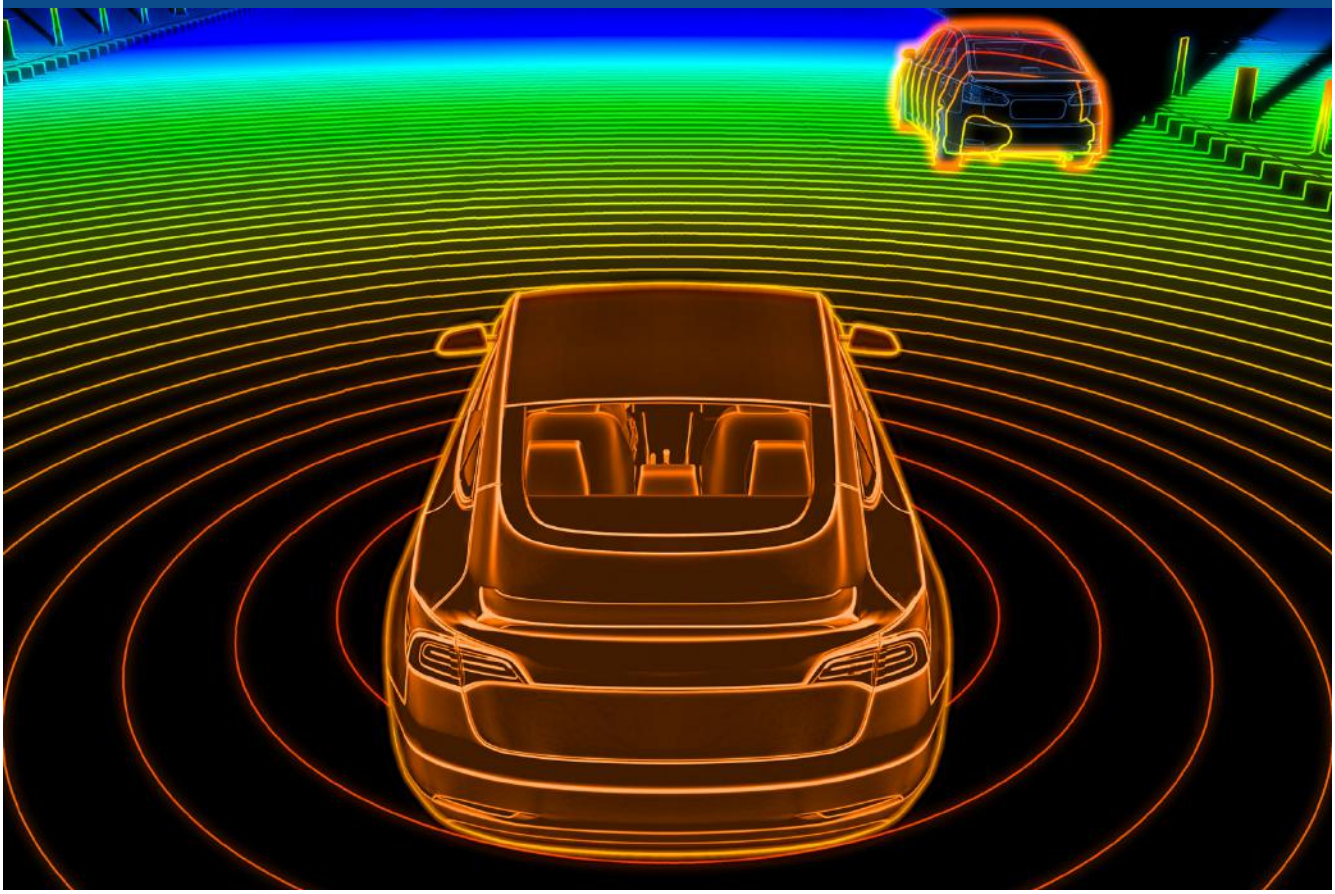


EDITORIAL

'Navigation on Autopilot' Makes Lidar Attractive in China

In China, demand for 'Navigation On Autopilot'—NOA—has become a key driver of the automotive lidar market. That's because of lidar's unique high-resolution capability in urban environments. It's a bit ironic the function is called as it is, for 'Autopilot' is Tesla's marketing name—deemed misleading by regulators around the world—for a camera-only, no-lidar L^2 driver-assist suite with mediocre performance. Nevertheless, car companies offer 'NOA' as a premium, paid software upgrade to owners of premium models with the necessary sensors. Huawei is gaining strength with their intelligent driving platform, signing partnerships with Chinese automakers; find more detail in this issue of your DVN-Lidar newsletter.

With lidar volumes growing, a fully-automated production line is increasingly necessary to stay competitive. We've got an interview on that subject and others with FiconTec's Simon Viet.

NOA and ADAS L^{2+} applications are among the topics to be discussed at our next Lidar Deep Dive event scheduled for 8-9 April in Stuttgart; in this newsletter you'll find the docket for that event.

CES is just days away from opening, and we bring you relevant news of innovation award winners Hesai, Valeo, Lumotive, and Innoviz; also Aeva, Robosense, Canatu and more.

Here's your list of forthcoming DVN-Lidar events; be sure and save the dates:

- Deep Dive 1 in Stuttgart, 8-9 April
- Deep Dive 2 in China (location tbc), 11-12 June
- Deep Dive 3 in Detroit, 11-12 September
- Lidar Conference in Wiesbaden, 18-19 November

We're ever so glad you're here with us in the DVN-Lidar community. Enjoy this 22nd newsletter!

All best,

Alain Servel

DVN LIDAR ADVISOR

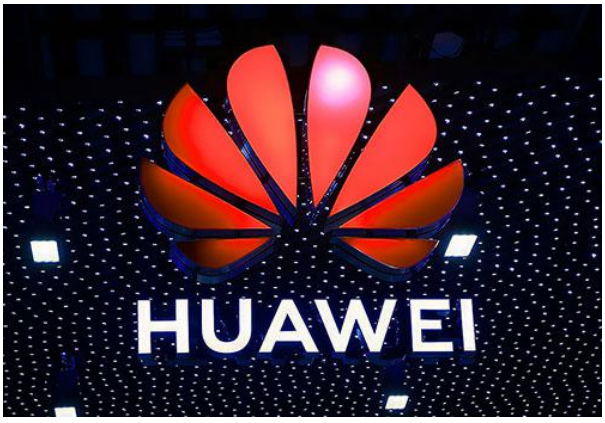
LIDAR BUSINESS

Lidar Business Newsbites

In November, China's new energy vehicle (NEV) market volume exceeded 1 million units, with 1.026 million vehicles sales. NEVs made up 34.5 per cent of the country's total auto sales last month. That figure Includes 653,000 BEVs, and 309,000 PHEVs. Key contributors included BYD (301,378 units), Tesla (82,432), SAIC-GM-Wuling (71,143), Geely (64,834), Changan (42,099), GAC AION (41,567), Li Auto (41,030), Great Wall Motor (31,170), SAIC Passenger Vehicle (28,280), Seres (21,170), XPeng (20,935), SAIC VW (19,659), Leapmotor (18,508), andNio (15,959).

RoboSense, in October alone, sold nearly 30,000 lidar units—of which over 28,000 for automotive applications. As of end October, RoboSense had secured anticipated orders for mass production from 21 automakers and tier-1 clients, involving 61 vehicle models.

Avatr announced the nationwide delivery launch of their 12 ("one-two"), arriving gradually in 40 cities. The Avatr 12 integrates the Huawei HarmonyOS 4.0 smart cockpit, with dual 6.7-inch HD screens as sideview e-mirrors. It's got 29 sensors as standard equipment, including three lidar units, bolstered by the Huawei ADS2.0 intelligent driving solution—so no high-definition maps are needed.



Huawei's Intelligent Automotive Solution business unit CEO, says the company's intent is for their automotive BU to operate independently with equity invitations to partner in their Huawei Smart Selection car projects sent to the likes of Seres, Chery, JAC, BAIC, and FAW. Huawei and Changan have agreed to cooperative investment.

Huawei's Harmony Intelligent Mobility Alliance (HIMA) has officially launched the Luxeed S7, which includes the Harmony OS 4 intelligent cockpit and the company's ADS 2.0 advanced intelligent driving system.

Innovusion has changed their English name to Seyond, a portmanteau of *see* and *beyond*, and introduced a new brand logo. The company's Chinese name remains unchanged. The increasing Chinese-market interest in NOA (Navigation on Autopilot) makes lidar especially attractive in China. Seyond has implemented lidar into nine passenger car models, and forged collaborations with autonomous commercial truck companies such as TuSimple, Zhito, Plus, Eacon, DeepWay, Autra Tech, and Driveblocks. Robotaxi operators like Mogo Auto and Caocao Mobility, and smart highway and infrastructure companies are Seyond customers.

Chery's iCAR 03 Smart Driving Edition has DJI Automotive's pure-vision intelligent driving solution, equipped with advanced intelligent driving capabilities relying solely on biologically inspired binocular pure vision sensors, as confirmed by the system's supplier, DJI Automotive. The set-up includes a dual 8-megapixel forward-looking inertial navigation stereoscopic cameras, a single 3-megapixel rear-view monocular camera, and four 3-megapixel panoramic fish-eye cameras. The array enables an extensive suite of functionalities like memory driving, highway piloting, and cross-level memory parking within its 7V configuration platform, said DJI Automotive.

ZF is no longer pursuing a goal of offering complete autonomous transport systems, including shuttles and fleet management. Instead they want to reorganize their global shuttle business and be a technology provider for autonomous driving. Existing partnerships and projects in connection with the existing shuttle will be continued.

Hesai is facing multiple allegations and concerns from the U.S. House of Representatives, regarding the company's operations and technology. Key points from Hesai's response:

- Data storage and transmission: Hesai says their lidars, including the Pandar128 and AT128 models, lack data storage or wireless transmission capabilities.
- Cybersecurity credentials: Hesai lists their efforts toward cybersecurity, including ISO/SAE 21434 certification and a high-level TISAX assessment.
- Surveillance capabilities: Hesai says their lidars cannot capture biometric data, ensuring greater privacy protection than cameras.
- Military use and certification: Hesai says their products aren't designed for military use, and are classified as EAR99 by the U.S. Department of Commerce (EAR99 items are mostly low-technology consumer goods not requiring an export license, unless they're sent to an 'end-user of concern' or in support of a prohibited end-use).
- Intellectual property compliance: Hesai refutes U.S. Government allegations of IP infringement, citing their legal victory against competitor Ouster.
- Independence from Chinese Government influence: Hesai says they operate independently, without government equity investment or intervention.

Torc Robotics and Uber Freight have announced a strategic partnership to leverage Uber Freight's logistics network for development and deployment of Torc's autonomous truck technology. Potential benefits include accelerated development, with Uber's data and insights accelerating Torc's aim to launch autonomous trucks by 2027; seamless integration of autonomous trucks into existing logistics infrastructure, and supply chain efficiencies.

The Automated Vehicle Safety Consortium (AVSC) has recently welcomed Torc Robotics and Zoox as members, joining the likes of Aurora, GM-Cruise, Lyft, and Waymo. This move is meant to strengthen the consortium's mission to advance the safety and development of AVs. The AVSC, under the SAE Industry Technologies Consortia, brings together manufacturers, developers, and fleet managers to collaborate on safety-related best practices for AVs.

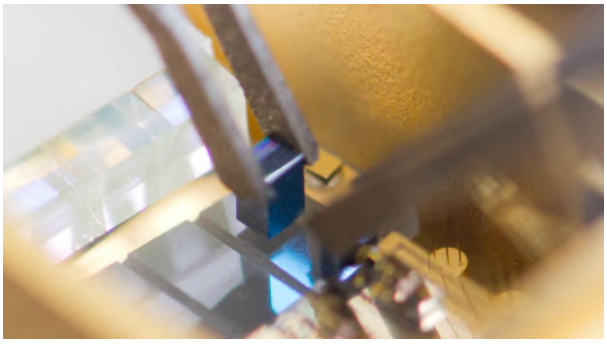
LIDAR AND IMAGING RADAR TECHNOLOGY NEWS

Ficontec's Simon Viets on Lidar Production-Test-Calibration, Scramblux

Ficontec is a photonics assembly and testing specialist company headquartered in Achim, Germany. In 2022, Simon Viets became the company's Global Business Development Director. Previously, he worked at Trioptics in roles including Head of Quality Management and Deputy Head of Sales. In 2018, he joined Automated Engineering, in positions including Director of Sales for Europe, China and Southeast Asia, with a focus on optical metrology and manufacturing systems for the automotive industry. He shared his thoughts with us on lidar-related matters, and here's what he had to say:

"Within the dynamic landscape of sensor technology development, lidar has emerged as a pivotal and indispensable tool for industrial and commercial 3D perception that is transforming applications ranging from autonomous vehicles to environmental monitoring. As the adoption of lidar sensors into various sectors continues to surge, there is commensurate demand emerging for efficient, accurate, and scalable production, testing and calibration solutions. In this context, Ficontec—a globally established provider of automated production solutions for optical microassembly and test—has embarked on a transformative journey in partnership with Scramblux, an early-stage startup that has pioneered a groundbreaking lidar test and calibration technology. This collaboration marks a significant leap forward in the realm of lidar volume production.

"Ficontec brings over two decades of expertise in optical and photonic device microassembly and test to the table. Our success is grounded in providing highly-valued development, batch manufacturing and volume production solutions for diverse optoelectronic and photonic applications, including telecom-datacom, high-power laser diode assembly, automotive sensors, lighting, optical fiber-coupled devices, as well as for the integration of photonic integrated devices (PIC). By specializing in high-precision optical engineering, Ficontec has long mastered the art of assembling intricate optical components with the highest degree of positioning accuracy and finished device reliability.



Precision optical alignment

"Over the last few years, the skills gained in these diverse sectors have come together to provide crucial development and manufacturing solutions for a gamut of different lidar developments and applications. As automotive lidar systems have become integral to ensuring safety and enabling autonomous driving, the demand for precise and reliable assembly processes is more significant than ever. Ficontec's proven capabilities position us as a key player in meeting this demand, providing solutions that set the standard for quality and efficiency.

"Recognizing the growing demand for lidar solutions, in particular in the automotive sector, Ficontec has strategically partnered with Scramblux, an innovative startup at the forefront of lidar testing and calibration. At the core of this collaboration is their groundbreaking Scramblux BeamScrambler, an advanced optical measurement tool specifically designed for testing and calibrating lidar sensors across a wide range of performance parameters.

Scramblux BeamScrambler for wide-range sensor test system

"The integration of the BeamScrambler into Ficontec's volume production solutions enables a number of key advantages for lidar systems manufacturers. BeamScrambler brings two important benefits to the process of lidar end-of-line testing and calibration—a substantial reduction in the required floorspace as well a significant improvement in cycle times for the necessary procedures. Moreover, the lidar systems can be tested at full field-of-view and at multiple ranges up to the full range, all in a single measurement and within the same reduced footprint.

"Ficontec will offer customers a revolutionized lidar testing experience like never before. The benefits go beyond mere efficiency gains as the measurement advantages presented are unprecedented; not only does this streamline the production process, the overall quality of the manufactured lidar systems can also be enhanced. Moreover, this technology enables significant initial investment cost savings associated with reduced total cost of ownership and with the considerably smaller production line footprint.

"The partnership empowers Ficontec to offer a more modern and comprehensive suite of services for volume lidar manufacturing needs. This embodies both passive and active optical alignment technologies, qualified industrial bonding technologies—soldering, welding, epoxy—and a range of optical test and characterization technologies. Now, with the incorporation of the BeamScrambler technology, the suite of available end-of-line testing capabilities is enhanced, is optimized for short cycle times, small footprint, full FOV measurement, and long-distance measurements up to the full range of the lidar.

Ficontec mass production line

"Ficontec has established ourselves as an innovator and leader for manufacturing technology as applied to photonic integrated circuit (PIC) integration and hybridization (a.k.a. packaging). This PIC sector and the markets for the associated applications are set to grow with a CAGR many times that of the general high-tech industry and equally more than that of photonics as a whole.

"As the automotive industry embraces FMCW and other more integrated lidar approaches for enhanced sensing capabilities, PIC technology becomes central. Ficontec's capabilities in PIC packaging, assembly, and testing enable us to meet the requirements of FMCW and other advanced lidar systems that involve the integration of various photonic elements into a single, compact package.

"The precision required for PIC integration and hybridization is one of Ficontec's many key capabilities. Fully automated systems ensure the delicate handling and completion of component processing steps, guaranteeing repeatability within the assembly process and long-term reliability of the completed and tested device. Moreover, a modular and reconfigurable approach to machine building additionally ensures adaptability in accord with evolving industry standards as well as cost-efficient repurposing at product end-of-life.

"For current and future lidar system manufacturers there are effectively three key take-aways:

- Ficontec's mechanical and optical assembly excellence is evidenced by a proven track record and positions us as a cornerstone among providers of photonics manufacturing solutions. Our capabilities ensure the reliability and accuracy crucial for the demanding requirements of automotive lidar systems.
- Ficontec's innovation and leadership in the area of die- and wafer-level PIC packaging, assembly, and test manufacturing solutions will prove pivotal as advanced and increasingly integrated lidar systems evolve and the integration of PICs becomes progressively vital.
- Scramblux's BeamScrambler technology provides a new and revolutionary tool, enabling direct measurement of key lidar performance parameters within a single system. It reduces cycle times and floor space requirements and provides gains not only in efficiency but can also potentially provide for substantial cost savings on the production line floor.

"Looking ahead, the collaboration between Ficontec and Scramblux not only transforms lidar production but also has far-reaching implications for the automotive industry. The BeamScrambler's capabilities will enable automakers to conduct real-world testing and calibration—and thus install lidars—in vehicles more affordably. This breakthrough technology further extends to the aftermarket, allowing for lidar test and calibration in automotive workshops and/or during the re-qualification of vehicles' systems.

The partnership between Ficontec and Scramblux represents a convergence of mechanical precision, optical expertise, and groundbreaking technology. As lidar continues to shape the automotive landscape, this collaboration stands as a testament to the industry's commitment to innovation, efficiency, and reliability. Together, we are not just revolutionizing lidar production; we are shaping the future of automotive safety and autonomy."

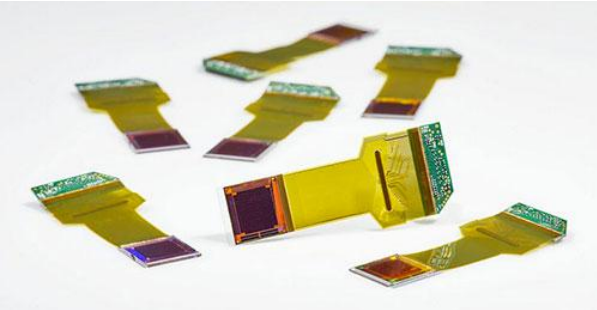
LIDAR AND IMAGING RADAR TECHNOLOGY NEWS

Lidar Tech at CES '24: Awardwinners & Must-See Suppliers

Innovation Award: Hesai ET25

The ET25 is Hesai's latest ultra-thin automotive lidar sensor for mass-market ADAS. Powerful, slim, and quiet, it provides automakers with more possibilities for ADAS applications. It is only 25 mm thick, making it ideal for rooftop and behind-the-windshield installation. It offers up to 250 meters' range without a windshield in front of it, with the finest angular resolution reaching 0.05° × 0.05°. The sensor uses just 12 W of power, and at under 25 dB, its noise level is less than that of a quiet library.

Innovation Award: Lumotive LM10



Lumotive's LM10 is the first production offering of their groundbreaking Light Control Metasurface technology, which provides truly solid-state digital beam steering for superior optical 3D sensing performance. As an optical semiconductor made using widely-adopted silicon manufacturing processes, the LM10 overcomes all the cost, size, and reliability limitations of traditional mechanical lidar.

Innovation Award: InnovizCore

InnovizCore is Innoviz' advanced automotive-grade hardware and AI platform for L^{2+} through L^{5} autonomous vehicles. The AI-powered platform includes:

- A powerful system-on- chip processor for executing computer vision algorithms, 3D mapping, localization, real-time driving decisions and many more features;
- Perception software that processes the raw point cloud data from the lidar and performs object and obstacle detection and classification, as well as range estimation, and
- The industry's first lidar-based Minimal Risk Maneuver (MRM) system that supports the transition phase between autonomous and manual driving.

Innovation Award: Valeo Scala^{3}

Valeo's 3rd-generation Scala lidar perception system is an automotive-grade high resolution sensor, allowing advanced perception in all conditions meeting the highest automotive industry quality and safety standards.

The high density point cloud and associated AI-based perception software enable high speed autonomous driving on highways in a wider range of conditions, increasing the capabilities of L^{3} systems by dint of a large extension of their domain of operation, and the scalability of L^{4} robotaxi fleets.

Worth the Walk: Automotive Lidar Exhibitors of Note at CES '24

Canatu, in **West Hall booth 4065**,will demonstrate their most advanced film heaters for lidar and camera sensor thawing and defogging, enabling autonomous driving in harsh weather.

Canatu will once again partner with other companies to showcase joint developments improving driving safety and comfort. Stay tuned for more details on the partners and demos as the event approaches. Meanwhile, this year's highlights will include a film heater demonstrator for ADAS cameras positioned behind the windshield, developed by Denso—it's integrated into the windshield by laminating it onto the inner glass surface using optically clear adhesive. There'll be a film inserts moulded lidar heater using Covestro Makrolon PC resin and Makrofol PC film, featuring high IR transmittance, high heating performance, and excellent processing. And showgoers will also see a film heater demonstrator for lidar cover glass, using the Canatu film heater, which is sandwiched between two interlayers.

RoboSense, in **West Hall, booth 5172,** will unveil the newest in their M Platform sensor range.

Aeva, in **West Hall booth 6841**, will showcase the world's first automotive-grade FMCW 4D lidar for advanced driving automation in mass-production vehicles. Aeva will also demonstrate their commercially-available Aeries II 4D lidar technology for automotive applications, demonstrate its micron-precise industrial metrology sensing technology for industrial applications, and provide a preview of May Mobility's Aeva-equipped autonomous vehicle platform.

LIDAR AND IMAGING RADAR TECHNOLOGY NEWS

Polestar 4 to be First With Mobileye Chauffeur, Now With Luminar lidar

Polestar is working with Luminar and Mobileye to enhance safety and the future autonomous driving capabilities of the Polestar 4 with the integration of Luminar's next-generation lidar technology with Mobileye's Chauffeur platform.

Announced in August, Polestar 4 is planned to be the first production car to feature Mobileye Chauffeur, now with Luminar lidar, which builds on the full-surround camera-based SuperVision platform available in the Polestar 4 from launch. Together, the three companies aim to offer eyes-off, point-to point autonomous driving on highways, as well as eyes-on automated driving for other environments.

With Mobileye Chauffeur, the Polestar 4 is set to feature three Mobileye EyeQ6 processors, a front-facing lidar from Luminar, and Mobileye's front-facing imaging radar to provide the extra layer of sensing and artificial intelligence needed to enable eyes-off, hands-off driving.

Building on the existing relationship between Luminar and Mobileye, the integration of Luminar lidar into the Polestar 4 also expands the partnership between Luminar and Polestar which was announced in January 2023.

Polestar CEO Thomas Ingenlath says the car "comes with the highly advanced Mobileye SuperVision ADAS from the start, and we look forward to expanding that with Mobileye Chauffeur in the future. Being able to add Luminar's industry-leading lidar to the platform's development increases the strong link between our companies and brings even more world-class technology".

And Mobileye CEO Amnon Shashua says, "Combining our base SuperVision with an independent second redundant perception system—consisting of Luminar lidar, radars and an imaging radar—enables true redundancy and a level of accuracy that lays the foundation for fully autonomous driving".

For his part, Luminar founder and CEO Austin Russell says, "After collaborating with Mobileye on a solution since 2019, the true fruits of our labour with them are being realised for the first time by transitioning out of R&D and into a production vehicle with Polestar. Together, we look forward to raising the benchmark in the industry for what a safe and autonomous future can look like".

DVN comments

Mobileye Chauffeur is a self-driving system designed to turn a consumer vehicle into an eyes-off/hands-off system, bringing a surround vision with radar, cameras and lidar coverage. For the Polestar 4, Luminar's lidar covers the frontal sector, for long-range obstacle detection.

LIDAR AND IMAGING RADAR TECHNOLOGY NEWS

Motional Robotaxi to be Built at Hyundai's Singapore Innovation Center

Motional Ioniq 5 robotaxi at Hyundai Innovation Center Singapore

Hyundai Motor Group and Motional celebrated, in November, the opening of the Hyundai Motor Group Innovation Center Singapore (HMGICS)—and announced that Hyundai and Motional's jointly-developed Ioniq 5 EV robotaxi will be manufactured there. The first production-ready Ioniq 5 robotaxis will be deployed as part of Motional's commercial services in the U.S., starting in 2024.

Motional and Hyundai say the Ioniq 5 robotaxi is one of the first L^4 AVs to be certified under the U.S. Federal Motor Vehicle Safety Standards. Motional President and CEO Karl Iagnemma says "HMGICS is a vision for transportation innovation. We're enormously proud to have the Ioniq 5 robotaxi manufactured at this facility and look forward to introducing the world to some of the first-ever FMVSS-certified autonomous vehicles. It's through the strength of our collaboration with Hyundai that we were able to develop an industry-leading robotaxi that meets rigorous federal standards and is ready for mass commercialization."

HMGICS CEO Hong Bum Jung says, "HMGICS stands as Hyundai Motor Group's first global innovation hub and global test bed for future mobility. Our mission at HMGICS is to revolutionize the mobility value chain by developing and producing advanced and diverse forms of future mobility solutions. Commencing production of the Ioniq 5 robotaxi in collaboration with Motional, we are committed to a continuous journey of innovation, aiming to spearhead the paradigm shift in the future of mobility".

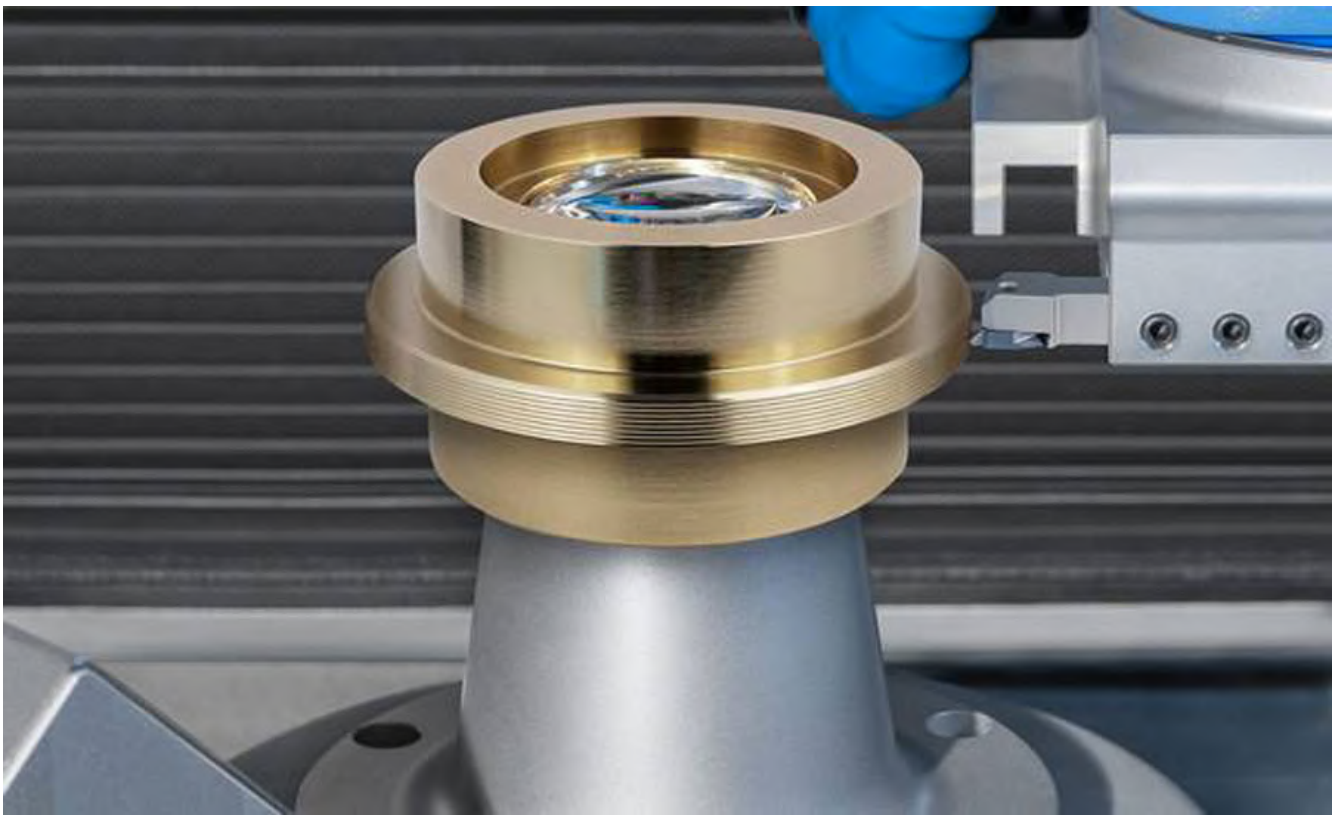
HMGICS combines advanced automation and real-time monitoring and data evaluation to maximize what's possible in production. It's equipped with bespoke advanced features to support AV production, including testing facilities and a calibration center. Motional has put a team on site to assist with production; these employees are located at the Autonomous Vehicle Integration Center and will perform diagnostics, software development, calibration, and validation tasks. Motional and Hyundai have been preparing to produce the breakthrough Ioniq 5 robotaxi for several years, including the development of a limited series of prototype vehicles tested in the U.S. and Singapore for over a year. The initial fleet of Ioniq 5 robotaxis recently completed a series of evaluations designed to demonstrate the quality, performance, and maturity of the robotaxi and its autonomous driving technology. Commercial production of the Ioniq 5 robotaxi is underway, and the first models have already arrived at Motional's facility in the U.S. The vehicles are undergoing rigorous testing and safety validation processes before beginning commercial service in 2024.

DVN comments

Motional develops over 30 sensors for robotaxis. A combination of cameras, radar, and lidar provide robust, 360-degree perception and ultra-long-range detection of objects for safe operation.

LIDAR AND IMAGING RADAR TECHNOLOGY NEWS

Trioptics ATS: Optical-Centered Threads, Grooves for Precision Lenses



For high-precision lenses, while mounting single lenses in sub-cells and processing them using alignment turning, the edge of the mount and the flange surfaces of mounted lenses are produced such that the mount's axis of symmetry coincides with the lens' optical axis and all lenses have the correct air gaps between them. After being machined, the mounted lenses are inserted into a lens barrel, without any more alignment steps needed. Often, elements are secured in the lens barrel by clamp rings at both ends. O-rings are used if the inside of the lens must be sealed—for example because it is filled with gas.

The Trioptics ATS 100, 200, 200 UP, and 300 UP alignment turning stations now enable advanced processing of lens edges with threads and grooves. The thread or groove is cut directly on the lens mount, thus saving time by integrating this into a single work process along with the other steps of the mount-edge machining. The scope of functions on these alignment turning machines can be expanded with a software enhancement and added tools.

In addition to saving time, the combination of thread or groove cutting with an alignment turning machine offers further advantages due to the alignment of the chuck with the optical axis of the lens. The threads and grooves are centred to the optical axis of the lens, while the standardized flank angles of the threads and grooves are achieved in a uniformly and reproducible way because of the simple tool movement in only one direction.

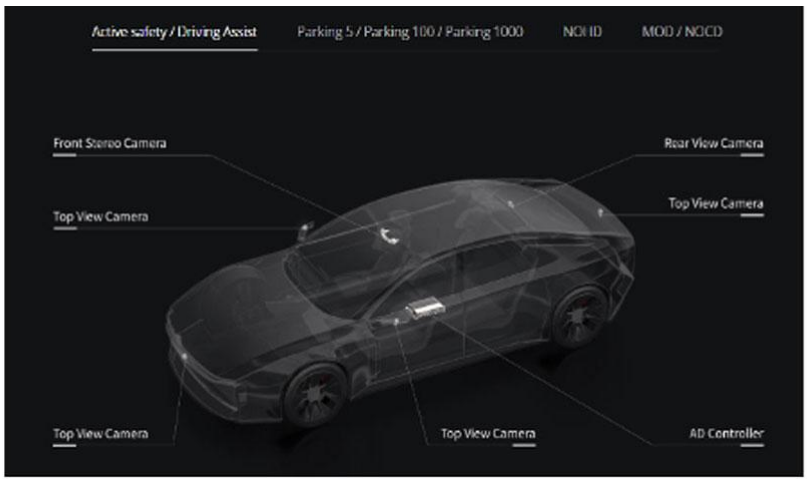
Applying a thread to the lens mount enables a fixed position of this element itself, which eliminates the need for clamping rings or allows individual, critical elements to be easily fixed within the assembly. This offers benefits if the overall size of the lens must be reduced. Grooves allow secure positioning of the O-rings and thus ensure optimal sealing of the lens against leakage of the fill gas.

DVN comments

The interaction of the optics and sensor chip of the emitter and receiver unit of the lidar sensor must be precise and perfectly aligned. Perfect performance must be ensured from the first sample to the series product. Trioptics is one of the most important companies to support lidar companies in production chains.

LIDAR AND IMAGING RADAR TECHNOLOGY NEWS

DJI Stereo-Camera Intelligent Driving Launches in China Market



Chery New Energy has opened pre-sales of their iCAR 03 Smart Driving Edition, the world's first mass-produced vehicle with advanced intelligent driving capabilities relying solely on binocular vision sensors, as confirmed by the system's supplier, DJI Automotive.

This model, which lacks ultrasonics, radar, and lidar, has a setup involving dual 8-megapixel forward-looking inertial navigation stereoscopic cameras; a single 3-megapixel rear-view monocular camera, and four 3-megapixel panoramic fisheye cameras. On this collection of cameras is based a suite of functionalities; according to DJI, the list includes active safety, driving assist, parking assist, navigation for city and highway driving, auto parking based on trained trajectory, and memory on driving.

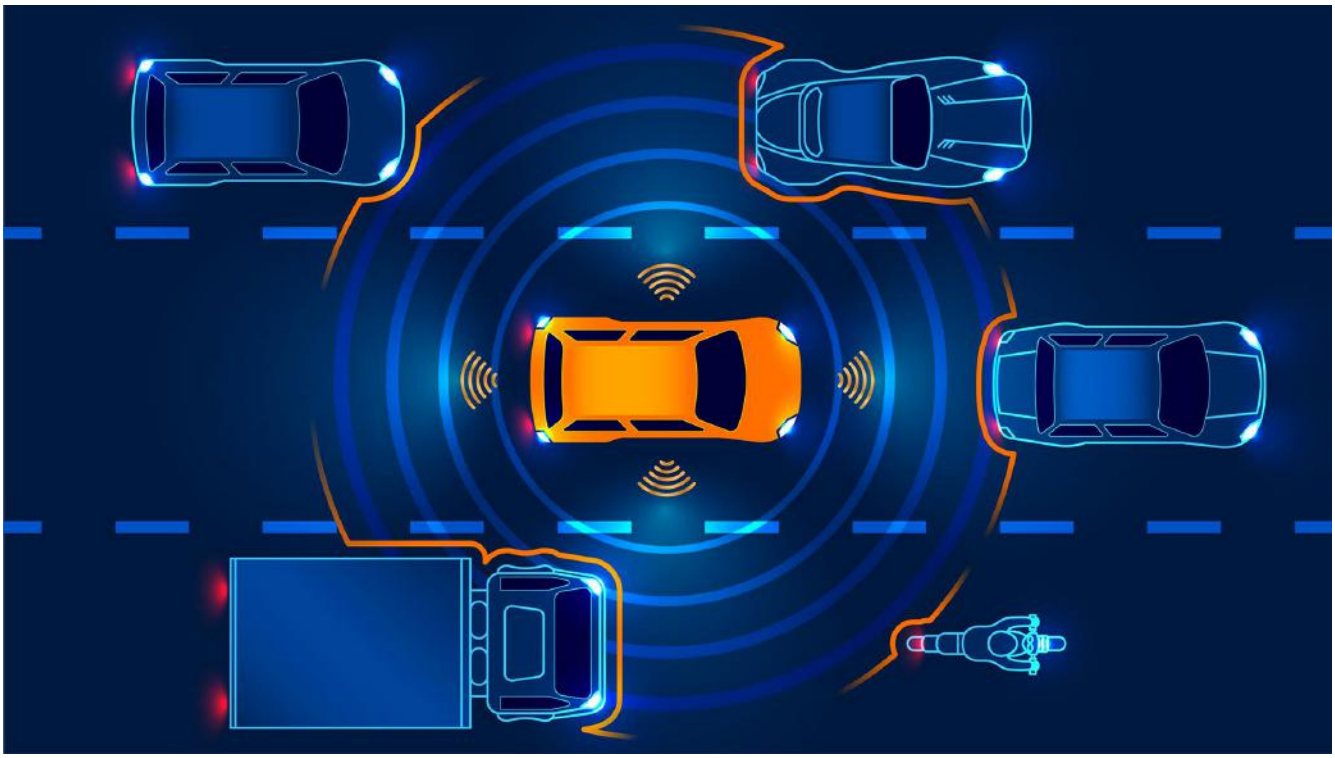
The feature list for city-driving navigation includes advanced lanekeeping; advanced cruise control; stop-and-go trafic jam pilot; 'short cut-in handing'; intelligent collision avoidance; driver-triggered lanechanging; advanced overtaking assistant; 'by-pass driving'; 'intersection handing'; traffic light and -sign recognition; toll station passing; 'ramp to ramp'; intelligent speed limit, and 'override'.

DVN comments

DJI is a new company with a strong focus on vision systems, pushing the stereo camera technology. They hope to become a key supplier in the future for ADAS. So far, the only attempt at camera-only autonomous vehicle operation has been Elon Musk's, who says lidar is "for losers" and went so far as to disable radar capabilities built into Tesla vehicles before Musk's decision to go camera-only. Tesla's camera-only L2 driver-assist suite has racked up a poor performance record and attracted increasing alarm from the world's safety experts and regulators; perhaps DJI and Chery will make a better go of it.

AUTOMATED DRIVING

AD Newsbites



BMW Group vehicles with L^3 autonomous driving features have received official public-expressway test licenses in Shanghai. Earlier, BMW obtained certification and approval for their L^3 autonomous driving solutions from the German Federal Motor Transport Authority (KBA). BMW models with this functionality are set for customer deliveries in Germany by Spring 2024.

IM Motors, the premium intelligent EV brand co-founded by SAIC Motor, Zhangjiang Hi-Tech, and Alibaba, has got highway/expressway autonomous driving test licenses in Shanghai for their L^3-capable vehicles. Aside from L^3 autonomous driving, IM's Highway/Overpass and Urban NOA (Navigate on Autopilot) have made significant strides. On 12 December, the coverage of IM Highway/Overpass NOA officially expanded to include 333 cities' expressways and 59 cities' overpass road sections on the Chinese Mainland, totaling an extensive 389,000 km of applicable roads. The official version of the highway/elevated-road NOA in the newly-added regions has begun rolling out to all IM L7, LS7, and LS6 users.

XPeng has initiated a second phase of public testing for their HD map-free XNGP intelligent driving functions. Since the comprehensive OTA release of the new Xmart OS 4.4.0 version on 28 November, XPeng's urban navigation assisted driving has been operational in 25 cities. This latest phase of public testing will encompass an additional 27 cities in China. XNGP, the maker's second-generation intelligent assisted driving system, introduces intelligent driving features for city conditions (City NGP) and enhanced functionalities such as Highway NGP and VPA memory parking atop the foundational XPILOT system.

Li Auto announced the launch of their latest OTA 5.0 software, with significant enhancements in intelligent driving covering highways, urban ring roads, and city streets. This functionality supports lane changes, speed control based on road limits, maneuvering around construction sites, navigating congested lanes, urban junction driving, and alternate-route selection in 110 selected cities.

The Toyota Sienna Autono-Maas (S-AM) Robotaxi, equipped with autonomous driving software and hardware from Pony.ai, has secured permission to transport passengers with remote monitoring in Guangzhou. The sixth-generation system is built on the foundation of its predecessor's multi-sensor fusion strategy, and introduces an affordable automotive-grade solid-state lidar. Since April 2023, Toyota's S-AM vehicles equipped with Pony's AD system have been conducting public road tests in Beijing and Guangzhou, accumulating over 1 million km of driving experience.

The University of Michigan, May Mobility, and the City of Detroit are joining forces to conduct AV testing. This collaborative effort is currently underway at the University of Michigan's MCity test facility. It aims to ensure that the technology is robust enough to safely cater to the needs of older adults and people with disabilities in Detroit.

A U.S. judge has determined there is reasonable evidence to conclude that Tesla and its CEO Elon Musk knew their vehicles had unsafe, defective 'Autopilot' systems but still allowed the cars to be driven in areas "not safe for that technology". The ruling last week from Judge Reid Scott, in the Circuit Court for Palm Beach County, means the family of a man who died in a collision while his Tesla's Autopilot was engaged can go to trial and seek punitive damages from Tesla for intentional misconduct and gross negligence.

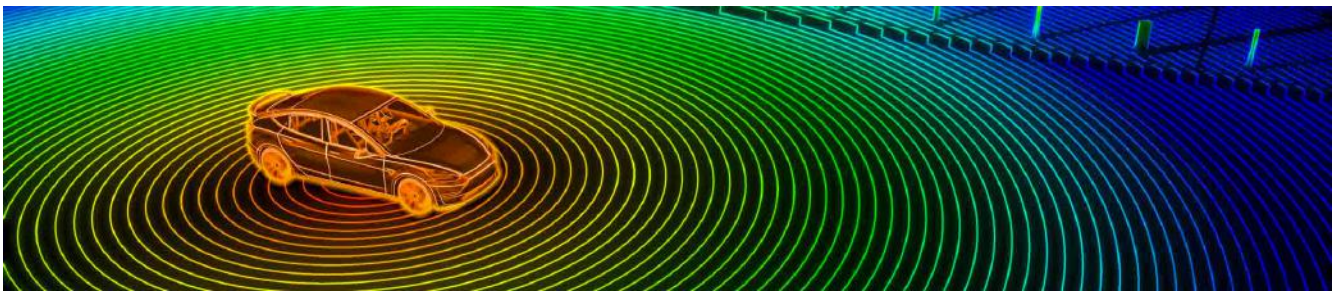
Over 2 million Tesla vehicles—nearly all of them ever sold in the U.S. market—are being recalled due to inadequate safeguards against driver misuse of the 'Autopilot' feature. Updates include increased prominence of visual alerts to remind drivers that they are still responsible for the vehicle's operation; simplified engagement and disengagement of 'Autopilot'; additional checks upon engaging Autopilot and while using the feature outside controlled access highways and when approaching traffic controls, and the threat of eventual suspension from 'Autopilot' use if the driver repeatedly fails to demonstrate continuous and sustained driving responsibility while the feature is engaged. Influential U.S. magazine Consumer Reports finds the recall insufficient, and the in-cabin cameras of recalled Teslas reportedly grow alarmingly hot with their increased usage after the recall.

WeRide's autonomous driving mini-bus, the Robobus, started its passenger-filled journey from Qingdao Jiaodong International Airport to the airport food court. WeRide, in collaboration with local partners, deployed several Robobuses for the Jiaodong International Airport - Qingdao Airport Food Court autonomous microcirculation shuttle loop, covering 8.2 km. Presently, WeRide's Robobuses are conducting road tests and operations in 19 cities globally, including Guangzhou, Beijing, Wuxi, Nanjing, and Abu Dhabi.

WeRide has received notification from the Land Transport Authority (LTA) of Singapore for Milestone 1 unmanned vehicle public road testing license (M1 license) and the T1 assessment self-driving vehicle public pathway testing license (T1 license). WeRide has become the world's first and only tech company to possess autonomous driving licenses in China, the United States, the United Arab Emirates, and now Singapore.

DVN-LIDAR DEEP DIVE

DVN-Lidar Deep Dive 1 Docket (April 8–9, Stuttgart)



8 April – Evening

20:00 Welcome Dinner, DVN members

Visit of the Porsche Museum planned - tbc

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9 April – Full Day

09:30 Opening of the Deep Dive

09:40-10:35 Session 1: Applications I
Highway Pilot L3 vs ADAS L2+
Q&A

10:35-11:30 Session 2: Technology I
Scanning Technologies & Solid State
Q&A

11:30-12:30 Working Groups and Sharing

12:30-14:00 Lunch Break

14:00-15:00 Session 3: Applications II
AD Regulation Status L^{2+} and L^{3}
Q&A

15:00-16:00 Session 4: Technology II
Sensors & Fusion for AVs: Lidar, Radar, IR
Q&A

16:00-16:30 Coffee Break

16:30-17:30 Working Groups and Sharing

17:30 Closure