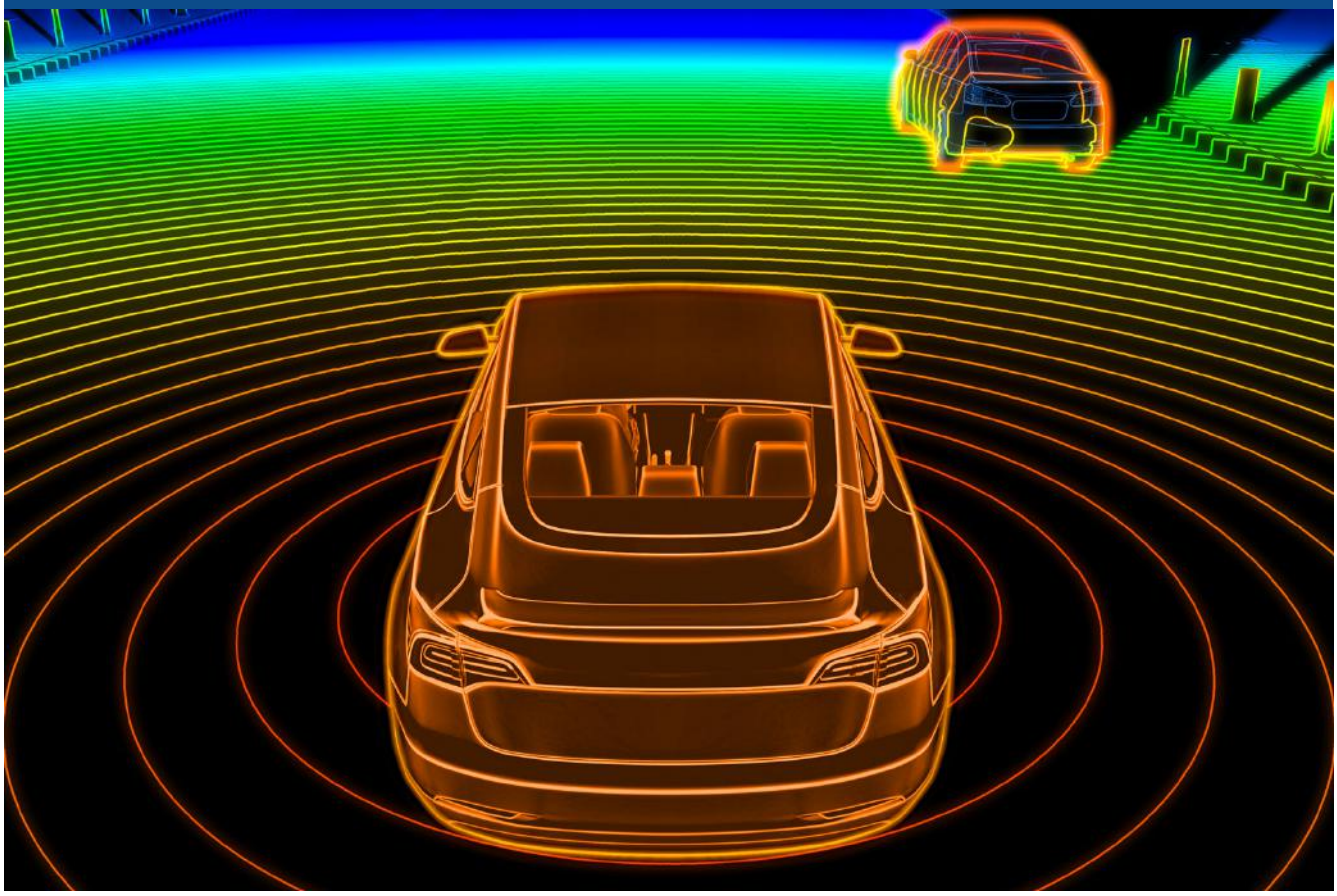
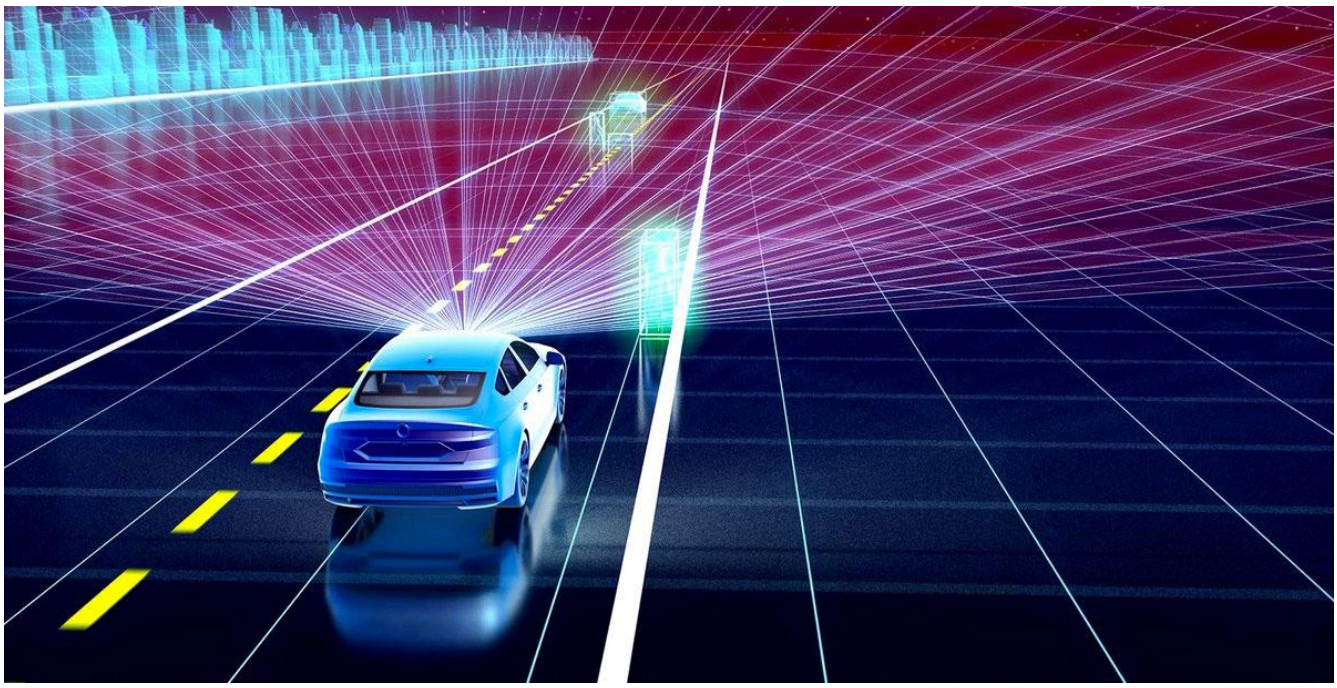
DVN
Lidar

Monthly newsletter #8

NOVEMBER 2, 2022



DVN Lidar Conference in Four Weeks' Time!



Editorial* · November *2022

We are very close now to our 5th annual DVN Lidar conference, which will take place on 30 November and 1December in Wiesbaden. This event has met with great success in previous years, bringing together all sectors and interests in the optical and automotive industries to discuss this increasingly-crucial technology. We are now in a growth phase; more and more manufacturers and suppliers are entering the development of driver assistance systems integrating lidar. The resultant L^2 and L^3 self-driving systems are expected to start rolling out in droves from next year.

This forthcoming (should we say 'fifthcoming'?) DVN Lidar Conference will bring together more than 200 worldwide participants—you and your company can network and promote your ideas and innovations with key managers; experts, and decisionmakers involved in automotive lidar. **Sign up** and save the dates; the whole DVN team are hard at work to make it a grand, worthy event!!

During our Workshop this past September we had a great presentation on lidar interference by Dr Thomas Luce from MicroVision. They are pioneers in MEMS-based laser beam scanning technology integrating optics; hardware; algorithms, and machine learning software into proprietary systems. In today's Newsletter, we take a broad, deep look at MicroVision’s expertise and expectations through an interview with CEO Sumit Sharma.

We also bring you interesting, relevant news around lidar developments; innovations; integration, and more.

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
FORMERLY WITH PSA GROUP

Interview: Sumit Sharma, CEO of MicroVision

Sumit was appointed Chief Executive Officer and a member of the Board of Directors in February 2020. Sumit joined MicroVision in September 2015, overseeing the company's engineering, operations, and R&D functions. Sumit has extensive background in high volume consumer electronics and automotive product development and launch. Sumit has held leadership positions in engineering and operations at Jawbone, Google, and MYVU Corporation. A patent holder, Sumit received a B.S. degree in mechanical engineering from the New Jersey Institute of Technology

DVN: Dear Sumit, thank you for giving us the opportunity for this interview. MicroVision is a high-tech company listed on the NASDAQ stock exchange. Can you give us a rough overview of the historical development of MicroVision?

Sumit: Thank you for the opportunity to share our story. MicroVision has a long history as a high-tech company. Our headquarters are based in Redmond Washington. We were founded in 1993 and in late 90's went public. From the beginning MicroVision has focused on laser beam scanning MEMS technology. Our first product and customer base were the US military. So high reliability MEMS and systems design is part of our DNA for decades. We expanded our technology offering to cover consumer electronics products, gathering extensive experience in cost optimization for high tech products. MicroVision has been a key technology provider for global OEMs like Pioneer, Sony and Microsoft and a few others. We started our internal R&D for lidar product as early as 2011 and continuously invested to developing a differentiated product. As I became CEO, I focused the company on our automotive lidar product and now the company is focused on enabling L3 ADAS features with our lidar and software offering.

DVN: Some years ago, MicroVision decided to include also automotive lidar into its portfolio. What were the main considerations to establish this strategic move?

Sumit: During our more that 10 years of R&D investment in lidar, we developed some key intellectual property that would enable a long range, high resolution, and low latency lidar in a small form factor. Our lidar has innovative features like active scan locking for send and receive channels that allows us to have high signal to noise ratio in 100k lux, pixel by pixel Automatic Emissions Control (AEC) that enables Class 1 safety implements at unit level, pulse encoding that allows us to provide a secure streaming lidar and of course object level software interface that OEM require. This is context.

Since we have a differentiated product, we decided to expand from being a technology supplier and provide a fully designed system which we have experience with. We believe to be successful in this space we need to dedicate all our financial and technical resources to the automotive space and establish ourselves as a Hardware and Software ADAS Tier 1 supplier to Automotive OEM and Integration Tier 1.

DVN: MicroVision just launched its latest automotive product *MAVIN DR Dynamic View Lidar at* the recent Autosens in Brussels. What were the reactions on your product offer?

Sumit: The reaction to the product introduction has been positive. We have MAVIN mounted on our demo vehicle in Germany and have had the opportunity to showcase it to OEM and Tier one in Europe. The response to the quality of the lidar and construction of the hardware has been very positive, and we move along in our engagements with interested parties.

DVN: MicroVision is working with MEMS based solid-state lidar technology. What is setting your technology apart from your competition in the automotive field? Can you mention some key specifications, engineering elements or application advantages?

Sumit: Lets discuss this in two discussion streams.

First, the key features of our technology are dynamic field of view with 100-degrees near field, 50-degrees mid-field and 25-degrees far field of view in the same lidar product, with a 200+ meter range we also have 0.04-degree vertical angular resolution through the entire field. All these specifications delivered at streaming 30 hertz point cloud. Each position in the point cloud would also be able to provide dual returns. The sensor also outputs 8-bit intensity of each pixel as well as axial and radial velocity of clusters. These features are delivered in a low-profile sensor ideal for roofline mounting with a visible aperture window less than 14 millimetres tall in our A-sample. And of course, one of the outstanding features is the pixel-by-pixel class 1 safety provided from within the lidar sensor which will further enhance OEM system functional safety.

Secondly, these features are enabled by MEMS running in non-resonating mode, active scan locked between transmit and receive side. The system utilizes our custom MEMS module based on 905 nm laser from a prominent German laser partner. Consecutively emitted laser pulses are coded in flight to achieve the point cloud density as well as provide immunity from other lidars operating at target wavelength. All this including our class 1 and object interface (driveable/non-driveable) running from our custom digital ASIC. I am very proud of our team to achieve this.

DVN: Some more detailed technical questions. Which wavelength range have you chosen for MAVIN DR? What are the reasons for this choice?

Sumit: We have chosen 905 nm multi-mode laser diode as our technology node for this component. With the extremely high automotive reliability and wide performance range required for a system like this, we chose to pick the most mature and tested laser wavelength available in market by one of the most trusted companies in laser field.

This laser coupled with our intellectual property of active scan locked MEMS and unique pulsing sequence, we can achieve the range and immunity to sunlight and other lidar. Additionally, our choice provides for the lowest expected power for the system. We are certain this is the right choice for our technology since it will dominate the lidar future.

DVN: The power consumption of lidar systems is estimated to be 7-10 Watts per lidar sensor. This is comparable to the consumption of a simple LED headlight. Will power consumption become a key criterion for application of lidar sensors?

Sumit: Power is always key for any system in automobile given the potential requirements of 105 C case temperature that will come for roofline mounting. We provide "smart pulsing" option to our customer as a one-time programmable feature that will allow power reductions. But the main power reduction comes for implementing our system in an ASIC form factor. Our choice of laser wavelength also provides the range with reduced power.

Smart pulsing is basically, within the field of views customer define regions that they do not require full pulsing, i.e., areas point towards the sky. With this we certainly will save a lot of power and be able to customize the hardware for each customer at firmware level.

DVN: MicroVision as a leading innovator is surely thinking about and even preparing a next generation of automotive lidar sensor. What in your view will be core elements for next generation lidars: new and additional features, performance improvements or cost breakthroughs?

Sumit: I believe as the market matures and larger economy of scale is possible our future product roadmap will be ready to support. We certain see cost breakthroughs required to achieve 10's of millions of units in future. To support this, we have concepts developed of a monostatic lidar with the same and perhaps higher performance criteria in place. Effectively instead of having a send and a separate receive path like we have today, we would be able to offer the performance in a product with a single optical path. This of course requires more customization of electronics components that are only feasible at higher economy of scales in silicon.

Additionally, we see our edge perception software to evolve further and provide object level sensor fusion of lidar and radar data streams as an important future key feature.

DVN: As a last topic of this interview, we would like to discuss more generally your vision about the evolution of the automotive lidar market. What is your estimation about the number of near range/mid-range/long range lidar sensors needed by the end of this decade on a premium vehicle?

Sumit: Our MAVIN product has been designed from the ground up to include near mid, and far field for the forward facing lidar in a single unit. To realize L3 high speed highway pilot features we believe 2 lidar per vehicle will be ideal. The rear facing lidar would require near and mid field performance only. A benefit of the lidar performance is that the number and sophistication of radar and camera sensors and required system calculation power can be reduced and system costs in fact will go down.

DVN: Which elements in your view can form the main three barriers for a fast market penetration and adoption of lidar sensors in automotive in the next years? How can they be overcome? Will there be regional differences between US, China, Japan, and Europe?

Sumit: The three main barriers will be sensor cost, low profile size and power. To overcome this is not rocket science fortunately. To contain cost, requires an established and reliable supply chain that OEM can verify and trust, as well as a technology which has proven scalability of cost with volume. To contain sensor size, requires innovative optical design with standard plastic and glass optics assembled on an automated active alignment line setup. This enables low profile sensors for roof line mounting. To contain low power, requires innovative features like smart pulsing and digital ASIC at 7 or 11 nm silicon nodes with object level interface implemented.

The regional difference would be at the OEM planning and manoeuvring software requirements. Our sensor is a measurement and edge perception device. We would provide clusters, tagged streaming point cloud and OEM software teams will control the l# ADAS features for their model for each region.

DVN: Dear Sumit, we thank you very much for this deep diving interview and we are looking forward to meeting you at one of our upcoming DVN lidar events again!!

Hesai Claim 10k Lidars a Month

Hesai say deliveries of their AT128 lidar have exceeded 10,000 units in a month, making them the world's first automotive lidar company to reach this milestone. This sensor is not the first hybrid solid-state lidar to enter the market, but it immediately won multiple contracts from leading automakers—including Li Auto; JiDU; HiPhi, and Lotus.

Hesai have optimised the internal architecture of this sensor, keeping the 128 channels despite the cost-reduction imperative. A 'genuine 128-channel' lidar, the company say, can precisely scan the environment into uniform, unstitched point clouds to help vehicles 'see' the 3D world clearly in real time. 128 laser channels also provide greater safety redundancy. Even if one laser channel fails, the rest will continue to operate to ensure normal function of the lidar. The AT128 was also designed with enhanced component integration—this minimises manual assembly to avoid human errors, in turn significantly improving production efficiency and consistency.

A strategic advantage for Hesai is their in-house manufacturing, facilitating rapid iteration and quality control crucial for automotive lidar. Their self-built factory enables a higher degree of control during each manufacturing step, allowing timely optimisations to ensure large-scale, high-quality mass production and delivery. The entire production line is 90 per cent automatic; on average, a qualified lidar unit is completed every 60 seconds. Hesai also have invested nearly USD $200m in their 'Maxwell intelligent factory', which has a planned annual production capacity of over one million units. This factory is expected to enter operation next year.

DVN comment

Yole Intelligence recently pointed out the strong emergence of China’s ADAS/AD industry. Chinese lidar manufacturers such as Hesai and Robosense have become important in the global lidar market, recently winning development contracts with the likes of Li Auto; JiDU; HiPhi, and Xpeng. These suppliers could also arrive on the European market via these Chinese carmakers in the coming years.

Crouching Lotus, Hidden Lidar

Lotus Eletre rear lidar

Lotus are the first car manufacturer to propose deployable lidar sensors on their first-ever SUV—the Eletre, slated for introduction as a 2024 model equipped with Hesai's AT128 lidar. Just as lidar is not needed all the time, the sensors on the roof and in the front fenders are hidden most of the time. When required, they deploy automatically, revealing themselves from beneath hatches just above the front and rear windscreens.

Deployable components are becoming a hot item on many new vehicles. From door handles to charge port covers, modern cars charm drivers with pop-up features on command. However, these designs are a poor choice for vehicles used in cold climates—too much risk of them freezing shut, or being blocked or fouled with snow; ice, or slush.

Lotus' plan is that with lidar onboard; plenty of cameras, and OTA updates, the Eletre will eventually be L^4-capable—freeing the driver from having to pay any attention to the road as the vehicle drives itself in given designated areas. The retractable lidar does a lot for the Eletre's lines, preventing the sensors compromising the vehicle's overall design.

DVN comment

Retractable sensors seem to be an attractive integration solution to avoid unsightly warts marring the equipped vehicle’s style. Some car manufacturers offer such functionalities on rear parking cameras—the VW golf, for example, which deploys only during reverse manœuvres. In the case of lidars, mechanical constraints could be more severe due to the necessity to preserve a correct vertical alignment of the sensor after each cycle.

Baraja See Major-OEM Buy-in on Lidar Scale-Up

Baraja are based in Sydney, Australia. They've devised a novel lidar technology based around wavelength-tuneable lasers, and now say they have signed a deal with a major automotive manufacturer that should see the hardware deployed in vehicles. Baraja say they have entered the agreement alongside Veoneer, with the aim of accelerating the scale-up in production required for automotive integration.

The Baraja Spectrum HD25 lidar is based on the company's proprietary Spectrum-Scan solid-state scanning platform. When this company emerged in 2018, they revealed this original approach based on tuneable lasers emitting around the telecommunications wavelength of 1.5 µm.

Baraja founding engineers Federico Collarte and Cibby Pulikkaseril had the idea to use components and technologies that were already mature; volume-produced; ultra-reliable, and affordable by dint of their extensive use in optical telecommunications. Their lidar's concept based on tuneable semiconductor laser and dispersive optics is very simple compared to the complexity of other solid-state technologies.

Baraja say the Spectrum HD25, the latest iteration of that approach, can use the inherent advantages of a Doppler system without the higher costs usually associated with using frequency-modulated continuous-wave (FMCW) lidar capture both the position and velocity of other road users.

The HD25 can deliver a range in excess of 250 meters with a wide field of view, from a compact system combining the laser transmitter, receiver, and fast-axis beam steering components on a single, integrated, wafer-scale package. Baraja say it "delivers the world's first lidar system combining per-point Doppler capability at the hardware level, with Spectrum-Scan and random modulation continuous wave (RMCW) ranging method to deliver unparalleled performance and accuracy at range and speed".

Veoneer initially chose to partner with Baraja after extensively evaluating 70 lidar technology companies globally. They chose Baraja based on their robust technology and product roadmap that lends itself to be among the smallest-size lidar technology to enable large-scale vehicle integration.

Baraja raised USD $32m in a series A round of financing in late 2018 and followed that up with a $31m series B effort last year, shortly before embarking on the collaboration with Veoneer.

DVN comment

The possibility to classify point clouds by their doppler is another advantage of radars. A single cycle of measure is sufficient to filter echoes by their speeds and quickly isolate a relevant obstacle. Other lidars spend numerous cycles of image's depth segmentations to evaluate relative speeds of objects. The use of per-point Doppler in HD25 lidar makes that this sensor can merge radar's performances in term of early objects separation by their speeds.

Trucking Platform Greenlights AEye

AEye have announced their selection by an undisclosed trucking platform partner that complements and builds upon AEye's existing pre-development programs with global truckmakers. The trucking platform provider will be revealed at the F3 Future of Freight Conference, taking place on 1-3 November in Chattanooga, Tennessee.

The pandemic-fuelled demand for goods has strained the logistics industry, causing fleets to accelerate autonomous trucking implementations with a more substantial volume ramp to fill the truck driver shortage.

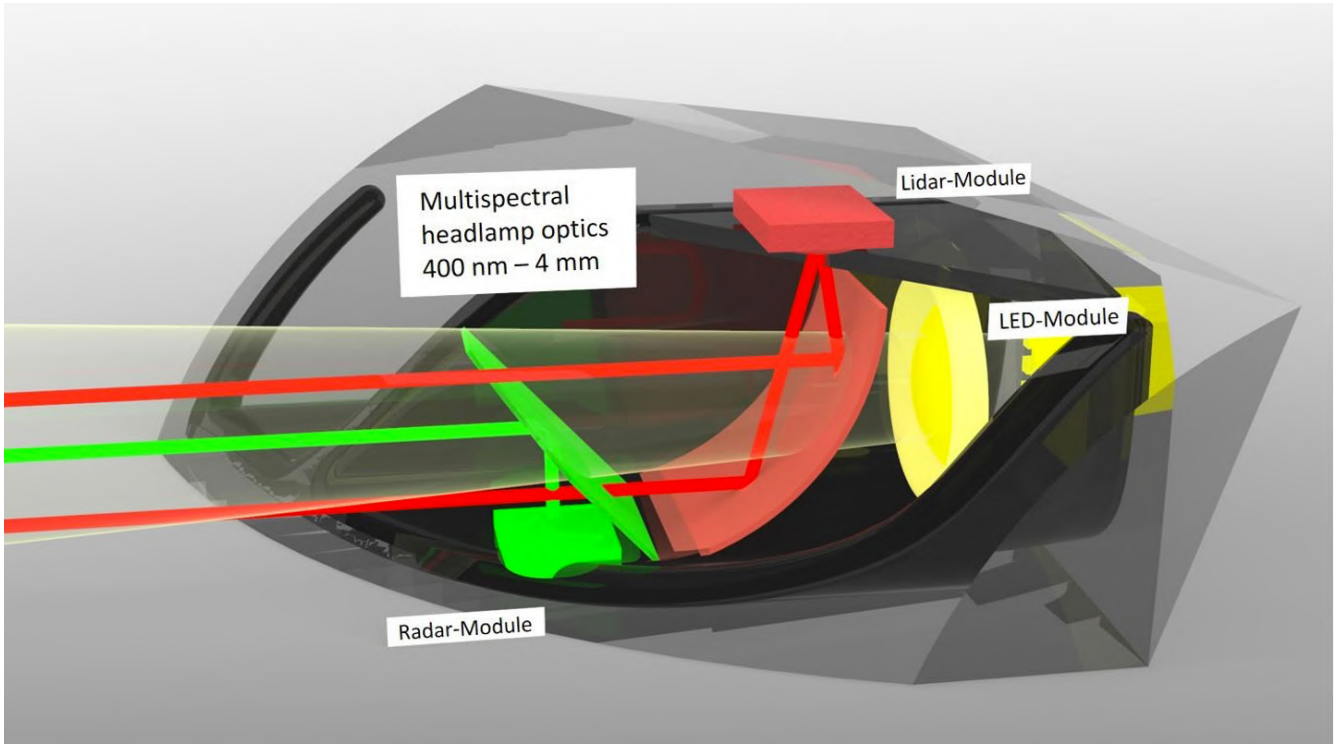
AEye's 4Sight™, an adaptive high-performance lidar platform with industry-leading range; resolution, and update rate is well suited for the requirements of long-haul trucking, where the detection of small obstacles at far distances in adverse weather while at high speeds is paramount, due to long stopping distances.

AEye's 4Sight sensors and Continental's HRL131 ("Lidar Development of the Year" per AutoSens) are both based on the 4Sight platform. AEye exhibited at the IAA commercial vehicle show in Hannover, Germany in September, and will be showcasing at F3 Future of Freight.

DVN comment

It has been demonstrated in the past by various pilot projects that the formation of convoys of automated trucks on the highways could significantly improve the carbon footprint of each of these trucks. The lidar sensor is the ideal sensor to ensure the stability and safety of these convoys.

Fraunhofer Consortium Mull Coaxial Sensors in Headlamps



Radar and lidar sensors integrated into headlamp

Five Fraunhofer institutes—including the Institute for High Frequency Physics and Radar Techniques FHR—have joined forces as part of the Smart Headlight project to create a method of installing sensors that is both space-saving and as subtle as possible, without compromising on function or performance. The project's aim is to develop a sensor-integrated headlamp for driver assistance systems that makes it possible to combine a range of sensor elements with adaptive light systems. It is hoped that this will improve sensors' ability to identify objects on the road, and especially other road users such as pedestrians.

The first stage in creating headlight sensors involves designing a lidar system that is suitable for integration into automotive technology. This also needs to consider the fact that the light beamed onto the road by the headlamp cannot be impeded by the two additional sensors, even though the LEDs that are responsible for the light are located far back in the headlight. For this reason, the researchers are positioning the lidar sensors at the top and the radar sensors at the bottom of the headlight casing.

At the same time, the beams from both sensor systems need to follow the same path as the LED light— something made more difficult by the fact that all the beams involved have different wavelengths. The visible light from the headlamp measures in the region of 400 to 750 nanometres, while infrared lidar beams range from 860 to 1,550 nanometres— different, but still relatively close to the visible-light range. Radar beams, on the other hand, have a wavelength of four *millimetres*. Guiding the beams coaxially in this way is crucial for preventing parallax errors, which are complicated to untangle. Additionally, arranging the sensors next to one another would take up significantly more space than a coaxial configuration, so the researchers are getting round this using what are known as bicombiners. To combine LED light and lidar light, this solution uses a dichroic mirror with a special coating, which guides the two beam bundles along a single axis by means of wavelength-selective reflection. The same effect happens in the second combiner (albeit in a more complex way due to the very different wavelengths), where the LED light; lidar light, and radar are combined. As radar sensors are already in widespread use in the automotive sector, bi-combiner designs must allow manufacturers to continue using existing sensors without the need for modifications.

The combination of lidar and radar fields of view will enhance the global performances of this multi spectral sensor. Lidars and cameras, for instance, demonstrate limited performance in situations where visibility is poor, such as foggy and dusty environments whereas radar systems can see right through dense clouds of fog. And radar systems are not very good at categorisation, while optical systems can tell whether something is a person or a tree.

Smaller light modules and lidar sensors and integrated radar sensors will make it possible to create multi-sensor concepts integrable in current headlamp internal volumes.

DVN comment

It can be attractive to merge different technologies such as lidar and radar in coaxial fields of view, especially if the functional requirements find an advantage in integrating these sensors in the corners of the vehicle. For car manufacturers, this simplifies the integration of each sensor, on the other hand it can induce higher costs and complexity on lighting systems. First results of this concept were presented and discussed at the 4th DVN Automotive Lidar Conference in November 2021. We are closely following ongoing progress of the Fraunhofer research conglomerate.

Blickfeld Lidar Protects Bridges

Every bridge has its capacity limits; there are many that may be driven over only by vehicles up to a certain permissible weight. Solutions are needed to identify these vehicles. Volkmann Strassen- und Verkehrstechnik, a major German company in the field of road and construction site safety, use Blickfeld's Cube 1 3D lidar sensors in their solution for this issue. The device identifies ineligible (overweight) vehicles and safely diverts them before they cross and pose a risk of damage to the structure.

In practice, it would not be feasible to measure each vehicle individually off the track on a static scale, because the traffic flow would come to a standstill, or at least cause delays and congestion. Therefore, weight measurement must take place while the vehicle is in motion. However, this presents technical challenges in clearly assigning the weight to a vehicle, and in taking photos of the licence plates of ineligible vehicles, as required for evidence assessment by the authorities.

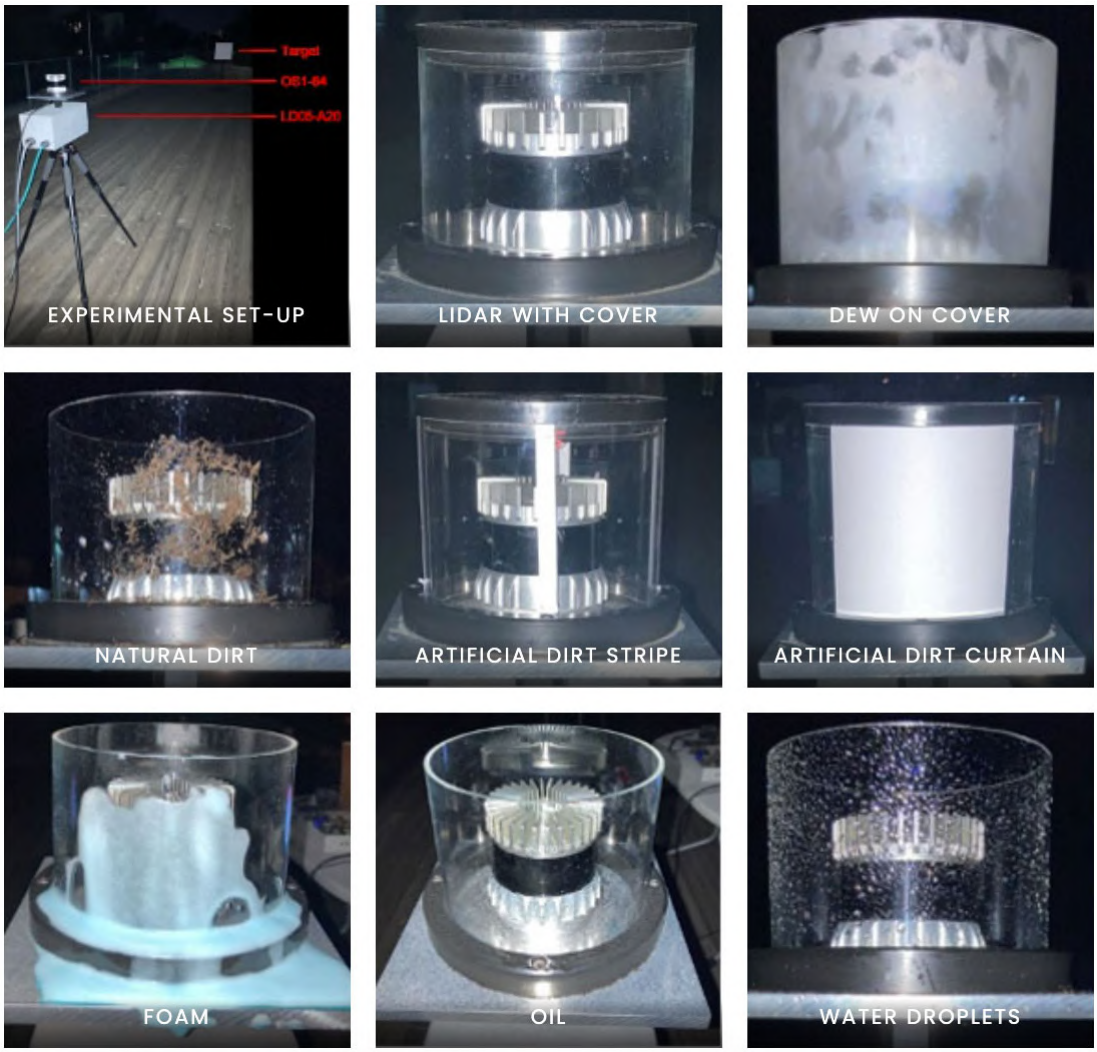
The unambiguous assignment of a weight to the correct vehicle is very important for data protection reasons, so photos are taken only of ineligible vehicles—and thus no photos are taken of vehicles that comply with the regulations. Volkmann have developed a measuring system to avoid taking improper photos, and that's where the capabilities of the Blickfeld Cube 1 sensors come in. They record the entire test field three-dimensionally, so it can recognise how many of what types of vehicles—cars; trucks; cars with caravans; vans; motorcycles, etc—are in which position on the measurement track at any given time, and to which the respective measured weight can be assigned when an axle is crossed. Based on this combined information, weight plus assignment to a vehicle, an identification number is assigned to each vehicle. This ID is the prerequisite for the system to trigger the camera when a vehicle exceeds the permissible total weight. Since lidar sensors record the scene anonymously, the right to protection of drivers' personal data is always upheld. Now the measurement system was recently tested very successfully on a private company site, Volkmann will be deploying it for the first time this year on a federal highway to protect bridges there from overloading. Taking the large number of weight-restricted bridges in Germany into consideration—2,700 are considered in need of refurbishment and are scheduled for modernisation by 2030—rapid expansion to other locations is likely.

DVN comment

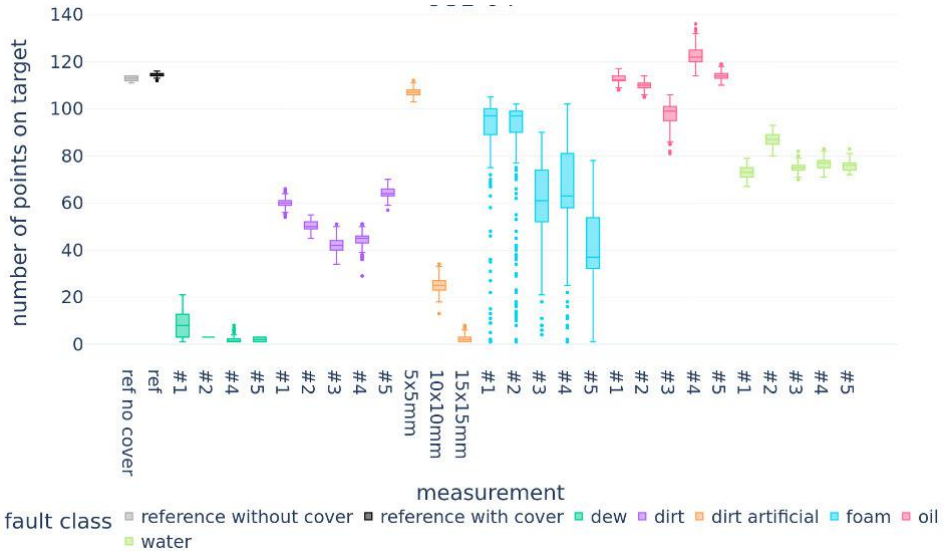
Blickfeld are now demonstrating that lidar can also participate, with other sensing systems, in a precise characterisation of vehicles in terms of dimensions and weight in different areas where geofencing must be applied. Infrastructure equipment is another market for lidar technologies.

Lidar Blindness by Cover Contamination

Fault Detection; Isolation; Identification, and Recovery (FDIIR) systems are essential for increasing the reliability of lidar sensors. Knowing the influence of different faults on lidar data is the first crucial step towards fault detection for lidar sensors in automated vehicles. Therefore, a team at the Austrian University of Graz investigated the influences of sensor cover contaminations on the output data of the lidar point cloud. The pictures show the experimental set-up and the different types of cover contaminations applied in the experiments. Such experiments simulate that a lidar sensor is not directly exposed to the vehicle exterior but sheltered by a cover (much like a headlamp).



For evaluation, the team recorded the point clouds generated by the lidar sensor under the different conditions. As a figure of merit they used the number of reflections on target during a predefined time interval (see example in diagram).



The reference measurements without contamination revealed a target of 110 points. For the different contamination types, five measurements were conducted to show some statistical relevance. Unsurprisingly, dew; artificial dirt over the entire transmitter, and foam lead to severe faults—sometimes even complete sensor blindness.

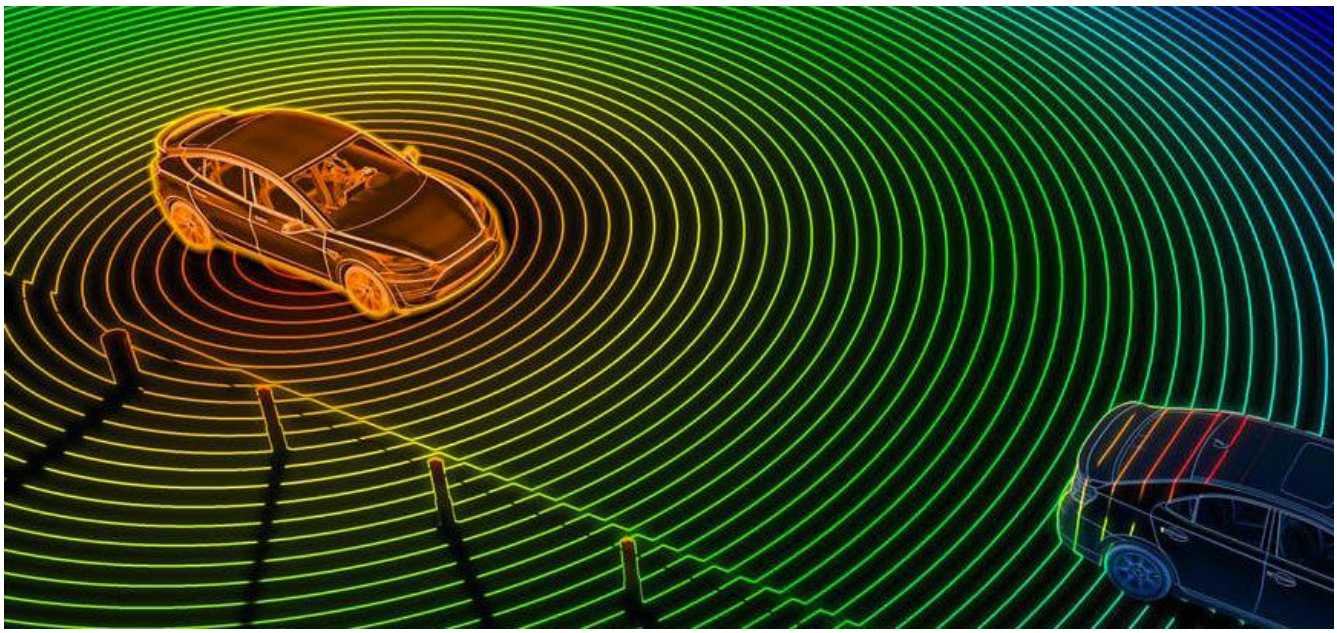
The team plan to investigate other contamination types like ice; salt water; salt residue, and accumulated snow on the sensor cover. Future work may also investigate the dependency of the results on target distance and material.

The researchers suggest that fault injection should be standardised to compare the lidar offerings from different manufacturers in terms of performance reduction by various kinds of contamination.

DVN comment

Like in a number of other publications, lidar sensor disturbance by environmental influences gets an increasing amount of attention. For a good understanding of lidar sensor reliability such investigations should finally lead to standardised test program. In a next and much broader step this research should not only include lidar sensors, but has to be extended to the reliability of fused sensors within the sensor suite of camera; radar, and lidar.

Event Spotlight: DVN Lidar Conference



With exactly 28 days to go until the start of the fifth edition of our focussed automotive lidar conference, we will shed a closer view on the agenda and highlight some topics. You can find the current agenda at the end of this section.

But before coming to the agenda, please be aware that the hotel rooms at the Dorint Pallas in Wiesbaden are almost fully booked, so here is a list of nearby hotels with less than 10 minutes walk distance:

- Mercure hotel Wiesbaden City
- Best Western Hotel Wiesbaden
- Hotel Aurora
- Star Apart Hansa Hotel
- Hotel Am Landeshaus
- Hotel Motel One Wiesbaden
- Intercity Hotel Wiesbaden

In our last newsletter we listed the keynote speakers—Marc Vrecko from Valeo and Bircan Taslica from TüV Rheinland. Both of them are excited to give their views on the various aspects of ADAS, AD and V2X communication and to exchange opinion with the conference audience.

In the meantime, the agenda is fully filled and you will find names and position of speakers on the docket below. In the following we want to highlight some presentations as we know them today:

- Christian Kobetz from Mercedes Benz will give deeper insight into the “Mercedes-Benz Driving Pilot”;

Christian Kobetz

- Fabien Bastide from Ansys will present his view about the lidar simulation tool chain;
- Pierrick Boulay from Yole developpement will focus on the current status of the automotive lidar ecosystem and market perspectives;
- Wolfgang Schulz from Continental will cover a special topic of KPI extraction for optimal sensor configurations;
- Tero Tolonen from Canatu will present advanced transparent heater technology for lidar covers;
- John Peek from KSLD will build a bridge from LIFI technology to lidar data transfer;
- Andy Zott from Scantinel will talk about Photonics integration enabling FMCW lidars;
- Niklas Andermahr from Dioptics will discuss optical design and testing for lidar sensors;

- Mrinal Sood from AEye will expound on software defined success of next generation lidar sensors;
- Dmitriy Yalid from Red Creamery will introduce an ultrahigh-resolution lidar sensor with mechanically modulated CW laser;
- Clemens Hofmann from AMS Osram will present a market and technology overview on emitters for lidar sensors;
- Ricardo Ferreira from Lingdao will describe combining hardware and software for lidar, and
- Alex Leuta from Opsys will describe lidar sensors with micro-flash scanning technology.

The presentation themes of the other speakers mentioned in the following agenda will be announced shortly.

Agenda: 5th DVN Conference on Automotive Lidar

Sessions: Applications; Use Cases & Testing; Technology; Ecosystem

Day 1 (Wednesday, 30 November)

11:30 Registration and light welcome lunch

13.00 Opening of conference by DVN CEO Hector Fratty and Keynote speech 1 by Marc Vrecko, President of CDA Business Unit at Valeo

13 :30 – 14.45 Session 1 · Applications I

- Peter Zegelaar, Ford AD Technical Expert (tbc)
- Maria Cristina Galassi, Scientific Project Officer at European Commission - JRC
- Achim Freiding, Manager Exterior Lighting at Hyundai Motors Europe (tbc)
- Great Wall, Speaker tbc
- Q&A

14.45 – 16.00 Session 2 · Applications II

- Christian Kobetz, Mercedes-Benz ADAS systems manager
- Emily Robb, ADAS Advanced Development at Stellantis (tbc)
- Henrik Eliasson, Lidar Performance Engineer at Volvo (tbc)
- Clement Nouvel, Lidar CTO at Valeo
- Q&A

16.00 – 16.30 Coffee Break

16.30 – 17.30 Session 3 · Ecosystem

- Pierrick Boulay, Senior Analyst at Yole Devellopment
- Fabien Bastide, Manager Application Engineering at Ansys
- Henri Häfner, Director Product Marketing & Business Development at Cepton
- Q&A

17.30 – 18.15 Discussion Panel I

18:45- 20: 00 Social Cocktail

20:00 Welcome Dinner

Day 2 (Thursday, 1 December)

07:30 Breakfast

08:30 Opening of conference and Keynote speech II by Bircan Taslica, Head of Global V2X, AD/ADAS and 5G at TüV Rheinland

09.00 – 10:15 Session 4 · Technology I

- Thomas Luce, VP Business Development at MicroVision
- Mrinal Sood, Technical Marketing Director at AEye
- Michael Kiehn, VP Advanced Development at Ibeo
- Alex Leuta, Business Development Manager at Opsys
- Q&A

10:15 – 10:45 Coffee Break

10.45 – 12.00 Session 5 · Technology II

- Dmitriy Yavid, CTO at Red Creamery
- Ricardo Ferreira, Teamleader Hardware at Lingdao
- Andy Zott, Managing Director Scantinel
- Clemens Hofmann, Senior Principal Engineer Lidar at ams-Osram
- Q&A

12.00 – 14.00 Lunch

14:00 – 15:15 Session 6 · Use Cases & Testing

- Adrian Zlocki, Head of Autonomous Driving at FKA GmbH/Aachen University
- Wolfgang Schulz, Product Owner Lidar Perception at Continental
- Thomas Reiter, Senior Manager AD at ZKW
- Niklas Andermahr, Division Head Inspection Systems at Dioptic
- Q&A

15:15 – 16:30 Session 7 · Technology III

- Tero Tolonen, Chief Product Officer at Canatu
- John Peek, Senior Consultant at KSLD Laser
- Jennifer Ruskowski, Head of Mobility at Fraunhofer IMS
- Jens Fischer, Senior Account Manager at Docter Optics

16:30 – 17:00 Plenary Discussion Panel II

17: 00 – 17:15 Closure