Tue, 12 April 2022
Weekly Newsletter

DVN
Lighting & ADAS

NEWSLETTER #746

Editorial

What Now For ADB: Mandatory? Obstructed?

At ISAL last week, there was a very interesting panel discussion led by Audi's Michael Hamm about the new ADB regulation and test protocol in the United States. This discussion came on the same day after Wolfgang Huhn suggested, in his keynote, that ADB ought to be mandatory to improve safety at night—not the first time this idea has come up; DVN has suggested this in past newsletters and reports.

The discussion panel comprised GM's Michael Larsen; Volvo's Paul-Henri Matha; Stellantis' Thomas Feid; DEKRA's Wilfried Van Laarhoven, and Michael Hamm.
Larsen summarised: ADB is legal in the U.S., but only if it meets the unique requirements NHTSA have just written into FMVSS № 108. These include a "transition zone" of just one degree from a shadowed to an unshadowed region of the beam (attainable only by very expensive pixel/matrix ADB systems) as well as tests on a curve of 400 metres' radius (difficult to manage and questionably relevant to any real-world issue). Even the old VHAD aiming system has been brough back from its well-deserved grave, yet another seemingly pointless divergence from the UN specification which has racked up millions of unproblematic kilometres and miles everywhere else in the world; see **DVN's analysis** of the U.S. rule.

This discussion was surreal; ADB as specified by the UN Regulations is significantly improving night driving safety; it saves lives and reduces injury and property damage, all over the world, except in the United States. Nevertheless, NHTSA—nominally a safety authority—hinders it by putting out impractical, unrealistic rules. We'd like to believe NHTSA genuinely wants the best for U.S. traffic safety, but they surely seem to have ignored and rejected the world's expertise on the subject, and automakers are unlikely to take a chance on offering ADB if they can't be completely certain their system is compliant with NHTSA's 300-page rule.

The whole lighting community, all around the world, will have to continue working together to find a way forward towards mandatory ADB—ideally with a single, global specification—rather than this pathetic situation of nominally-allowed, practically-prohibited ADB in the States.

A report summarizing the conferences presented at ISAL, is published today.

Sincerely yours

In Depth Lighting Technology

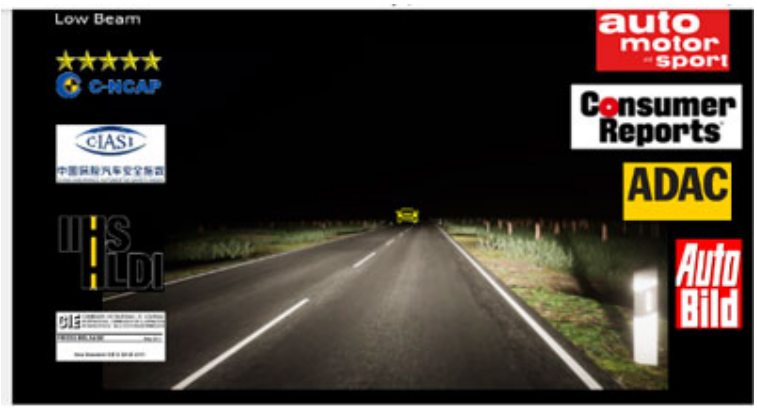
ISAL: The Main Takeaways

This year's International Symposium on Automotive Lighting was, once again, highly fruitful for the lighting community. Watch for our DVN Report on the event, with detailed coverage. Meanwhile, here's a summary of the main messages we retain a week after the event.

Innovation Focused on Functions, Not on Technology

Several lighting innovations were described, and they leaned heavily toward new functions—road projections, for example, implemented so as to attract attention without distraction.
But few innovations were showcased in technologies other than light sources.

Headlight Safety Performance Ratings



The need for a unified, veritable headlamp safety performance rating is becoming urgent to avoid unworkably confusing proliferation of ratings in the market and to be able to assess all functions—especially ADB. Work ongoing under GTB auspices and we will soon have a method to objectively quantify lighting system performance. Audi presented interesting sample data generated by assessing their various headlighting systems according to the HSPR.
A reliable, uniform rating system is absolutely necessary to improve lighting performance for the engineers working in the field, as well as for external and internal communication. It will be a great tool to avoid degradation of lighting and recognition of experts. It is, in fact, one of the key themes of the **DVN Study** published last October.

Lighting as Part of New System Architecture

Lighting is increasingly integral to a global system, for example with the integration in a new type of front fascia including illuminated grille and logo, also equipped with sensors (radar, lidar, camera…). Lighting engineering decisions now have to be considered with a system-based approach, not just in terms of discrete components. Integration is accelerating, too; evolving from distributed architecture, then domain centralised, before going massively to vehicle-centralised architecture.

Design

The styling trend carries on marching toward slimmer and slimmer lights; 10-15 mm height is becoming a standard target. Innovations in LEDs and related optical systems allow thin, efficient headlamps.

Sustainability

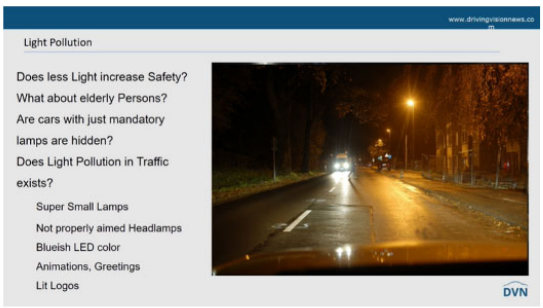
Sustainability is becoming more and more important. There's heavily increased focus on energy savings and weight reduction; material recyclability; repairability; modularisation, and new materials. The improvements for energy efficiency are not only done through the traditional improvement of LED sources, but also with more efficient optical solutions for lamps all over the vehicle. Smart systems are now necessary to adapt lighting to dynamic ambient situations. Yet at the same time, we're still presenting new systems using 50W-100W to make one function on each side of the vehicle—that's the same as in the days of halogen!

Simulations

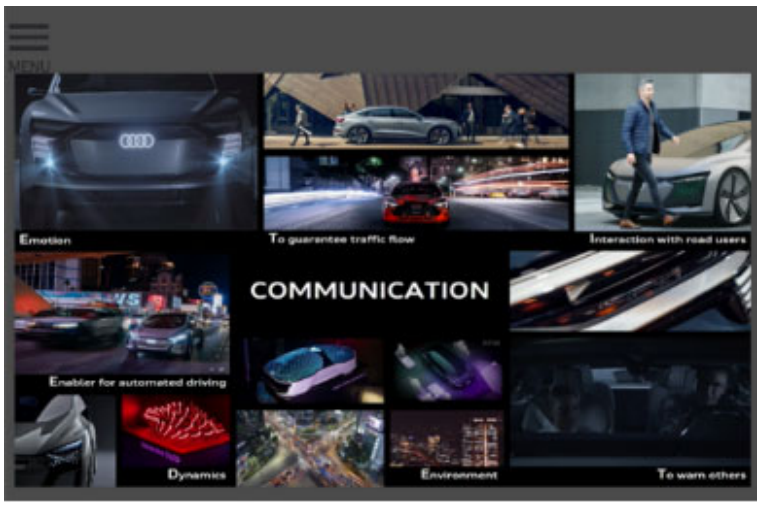
Virtual reality is improving rapidly, with more calculation power getting us closer to true-to-life simulation. We're still not quite there yet, but simulation is increasingly relevant and useful to optimise light distribution and numerous other parameters.

Some interesting lectures

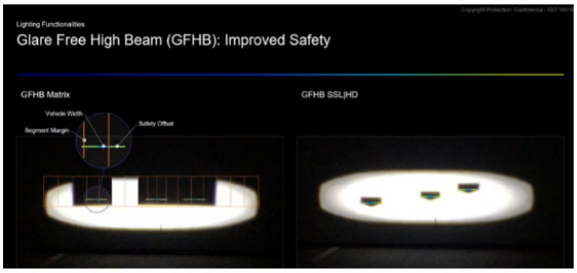
Wolfgang Huhn presented a grand keynote with his forecasts and predictions for the future of vehicle lighting.



Nice pictures from Stephan Berlitz on digital light and communication



Technical presentation of Michael Kleinkes on µLED ADB module



Two Panel Discussions

- Criteria of headlight performance rating system, chaired by Rainer Neumann: How to have a worldwide rating system?
- ADB in USA, chaired by Michael Hamm: the new requirements defined by the US authorities

A report summarizing the conferences is published today.

Lighting News

Motherson closes in on acquisition of Marelli
from "The Economictimes.indiatimes"

LIGHTING NEWS

Motherson Group is in an advanced stage of talks to acquire Marelli, owned by private equity firm KKR, in what would be the Indian company's biggest acquisition to date, people aware of the matter said.

A deal is likely to be announced by the end of May or early June, the people said, asking not to be named. They also did not reveal any likely financial terms or how the Motherson Group will fund the deal.

The acquisition, if consummated, will propel the group, India's largest automobile component manufacturer, to be among the global top-ten in the segment.

Marelli had posted revenue of more than $11 billion in 2021, almost the same as the Motherson Group.

Marelli was created in 2019, after KKR merged Calsonic Kansei, which it acquired from Nissan for $7.1 billion in 2017, with Magneti Marelli
In March 2022, the company, with total liabilities of $8.2 billion, went for a debt restructuring and settlement. This is not the first time Motherson Group has put in a bid for a company that is larger than it. Several of the deals were for financially struggling companies, which it acquired and then turned around.

The Motherson Group has undergone a restructuring and has created verticals under the wiring business and automotive lighting business. It is also diversifying into nonautomotive businesses, including aerospace, logistics and healthcare, from where it aims to generate revenue of $9 billion by 2025. Of the six other companies it is in talks with, the auto parts maker is very close to acquiring a tooling company, the people said. It is also planning to create a new entity for the polymer business.

Three questions to Paul-Henri Matha after ISAL symposium

LIGHTING NEWS

You are an expert on Sustainability, on Regulations, and on lighting technologies.
I would like ask you three questions on these topics, in relation with the lectures and panel discussion at ISAL.

DVN: For the first time a part of the symposium was dedicated to sustainability, not only on energy saving and weight reduction. Do you think it is a good way?

Paul-Henri Matha: It is not only a good way, it is a really great way. When we shifted from bulb to led 10 years ago, we thought that we did the job about power consumption reduction. But then we have seen that reduction was not enough and we see now the need to continue power consumption reduction. But it is not the unique thing we have to do about sustainability.We have to think circular economy, we have to think about repairability, usage of recycled material, etc... just an example: we are missing semiconductor, but how many lamps are going to the trash bins with good semiconductor we may re-use ?

The lamp repairability may be a solution. You have to change the complete lamp today when you have a light source issue or a mechatronic component that fail. This is not sustainable.

DVN: Several lectures talked on road markings and symbols. What is the status in GTB about what would be permitted and what it would be forbidden?

Paul-Henri Matha: I will talk now with my hat of Installation working Group chairman in GTB. After last GRE, we are continuing to work about road marking as a part of ADB. We have taken into account the remarks done by the contracting parties.

In parallel, we are working on new proposals with road marking as part of other lighting functions in regulation R149 (lighting regulation), especially for the cars that have no ADB and/or no AFS.

We are also working of a new text to be able to have signaling road projection in R48 and R148 regulation (signaling regulation) that may permit some signaling as part of turn indicator, reversing lamp or other lamp. We have seen a lot of presentation from Tier1, Tier2 and universities during ISAL congress. This is clearly something of interest for the customer and for safety.

DVN: I retain much fruitful information from the symposium, but not enough technologies in depth. What is your feedback?

Paul-Henri Matha: I have a similar feedback. The technology is ready, or will be ready. When we talk technology, we think especially Hardware, and this hardware is ready. But it is not only hardware, it is also software, and this software is not ready: how will we activate these lamp, how can we activate them in a smart way to be “sustainable”

We also need to adapt the regulation to be able to have the technology on the market. When we will know the legal conditions, we will be able to adapt the hardware and to design the software for activation conditions. So, the job to do is quite huge, even if we do not see for the moment a new technology breakthrough

How Automakers Benefit from Headlight Performance Ratings

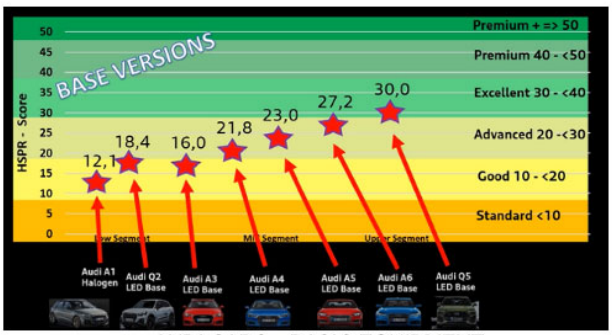
Michael Hamm, Audi

LIGHTING NEWS

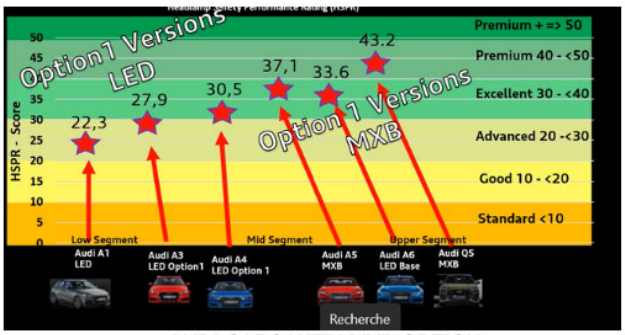
RANGE OF RATINGS FOR LOW-MID-UPPER SEGMENTS

Rating systems are today focused on low beam, because that's what's used in the large majority (95%) of driving time with manually-operated high beam, and in the majority (80%) with automatically-operated high beam. But when we talk about ADB, low beam is used only 30% of the time, and ADB 50%.

Using HSPR, the headlight safety performance rating system, Audi evaluated all their models with basic equipment as well as option-1 and -2 lighting configurations.



AUDI CARS—BASIC EQUIPMENT



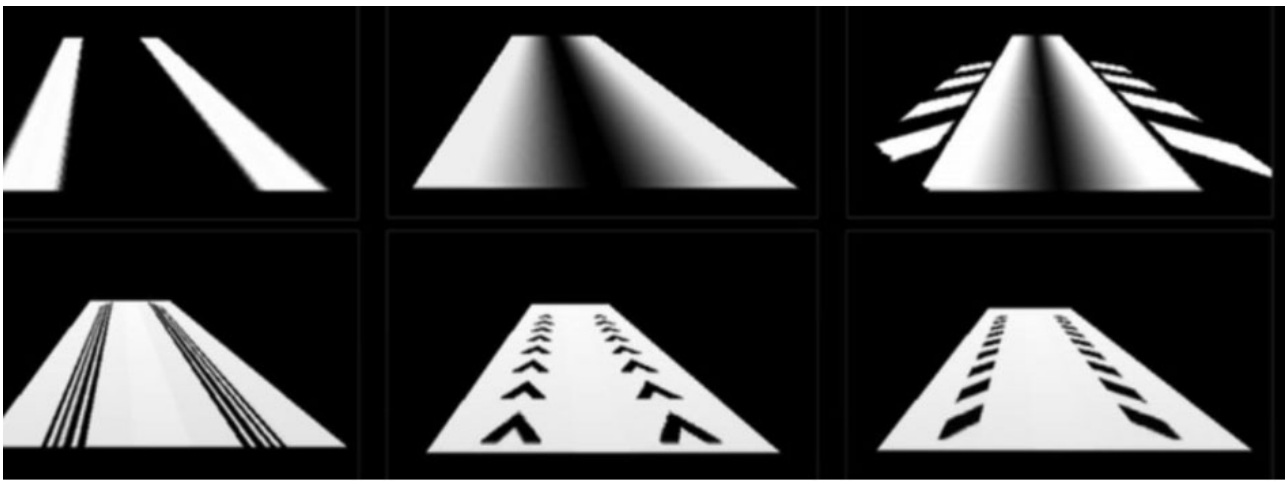
AUDI CARS WITH MXB OPTION

This exercise demonstrated how the HSPR system compares headlamp systems with all main functions, and allows customers to easily understand what level of overall headlamp performance they stand to get by choosing a particular model with a particular lighting system.

SSL+HD Light for New Safety Functions

Dr. Michael Kleinkes, Hella

LIGHTING NEWS



Hella's newest HD modules, with over 15 kilopixels, have standardised light source; improved efficacy, and high luminance capability.

The modules are compact—68 × 93 × 114 mm (h × w × d); the light-emitting surface is 40 mm^2. This system can support the two main types of car architecture, either with an ECU inside the headlamp for the control of the light, or as a puppet with the light controller embedded in the car's central computer.

Safety is improved by a markedly reduced margin (NHTSA might call it a "transition zone") around deglared traffic participants, and it can do a lot more than make headlight beams—project guiding lines with different shapes, for example.

Hella made a study to optimise these various guidelines, asking a panel which projected guidelines can be easily recognized and which design of the assistance function they like for straight and constant; length reduction, and bending guidance.

Seoul Semiconductor's ISAL Exhibit

LIGHTING NEWS

VIOLEDS FOR VEHICLE SANITATION; WICOP TECH APPLIED TO A MICRO DISPLAY

Seoul Semiconductor introduced a customizable LED technology for automobiles operating in the company's vision of a future lifestyle that provides a clean driving environment and safety for pedestrians.

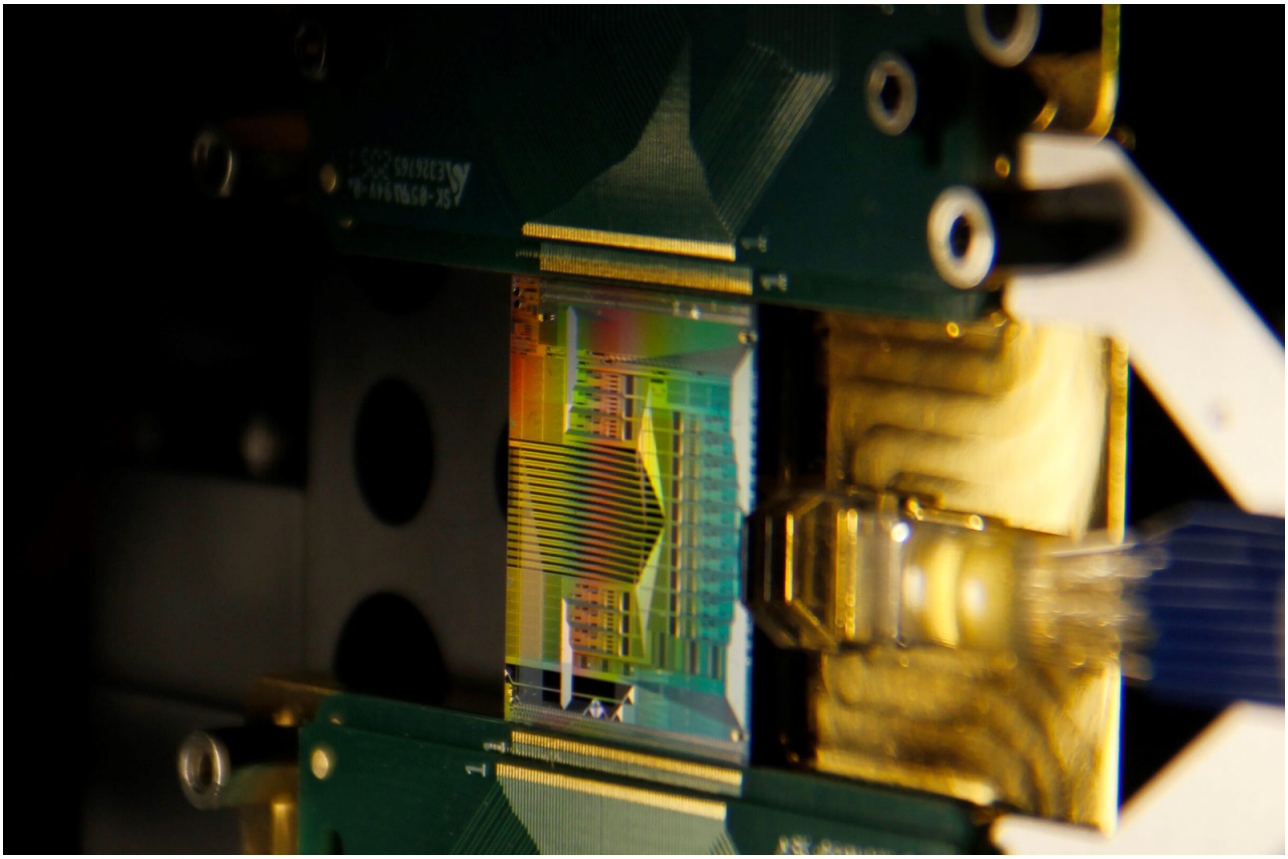
- Applications included:
- VioLED technology to kill surface and airborne viruses inside a car;
- Headlamps; DRLs, and micro-displays with WICOP technology that does not require wire connection or package;
- SunLike, their natural-light white LED technology—it's based on violet rather than blue LEDs—that protects the eyes of passengers and fully shows the natural texture of the interior;
- Various sensing functions from EPI to IR/VCSEL, with Seoul Semiconductor’s innovative technology.

In the second half of this year, Seoul Semiconductor will move their automotive headquarters to Germany to attract and interact with customers more readily.

Driver Assistance News

Scantinel Photonics demonstrates FMCW 5D+ Lidar

DRIVER ASSISTANCE NEWS



Founded in 2019 and based in Ulm, Germany, Scantinel Photonics , a leading FMCW lidar company, has demonstrated the world first full solid state parallelized FMCW 5D+ lidar system based on Photonic Integrated Circuit (PIC). The 5D+ scanning lidar measures the three-dimensional vector, velocity, reflectivity, and Meta information with an effective range of over 300 meters.

Frequency Modulated Continuous Wave (FMCW) LiDAR is the key enabler for long range (>300m) measurements and enables direct velocity measurement in every pixel, which is not possible for ToF (Time of Flight) systems.
The 5D+ full solid-state scanning measures the three-dimensional vector, velocity, reflectivity, and Meta information and has superior robustness and scanning rate potential. Mechanical moving scanning parts shall be reduced as much as possible and finally eliminated considering its fatigue-prone nature to meet the stringent automotive grade in an optimal way.

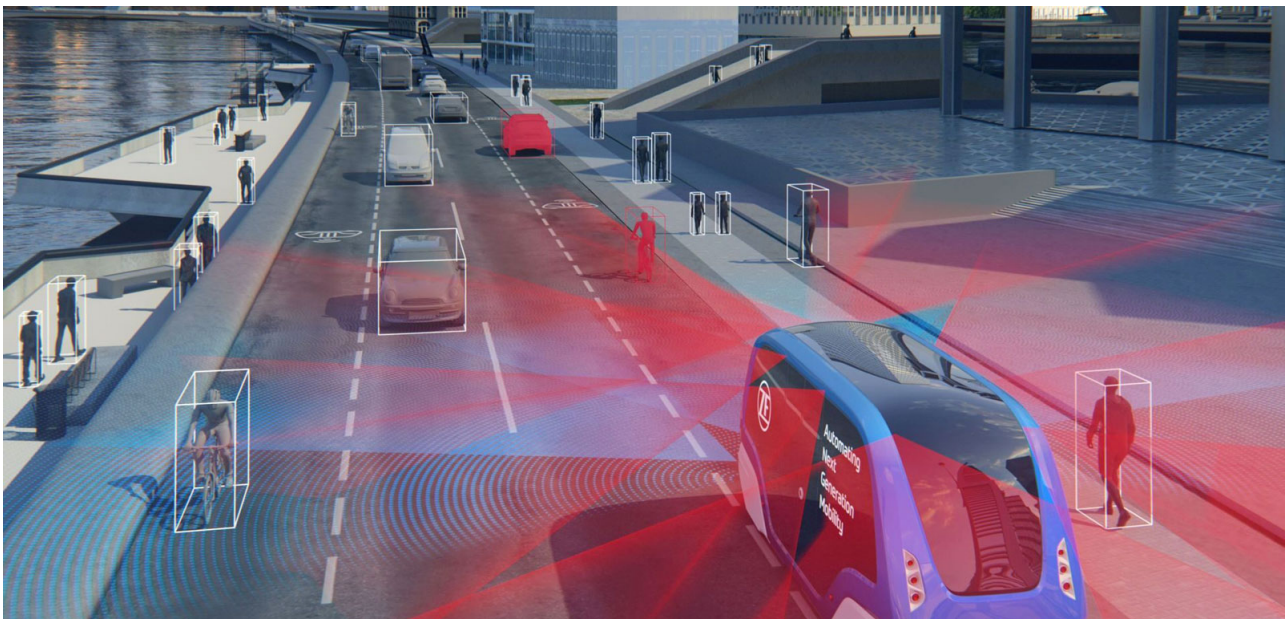
“Our unique FMCW full solid state photonic chip development is a groundbreaking work and takes lidar development to the next level” said the company

Furthermore, FMCW LiDAR based on Photonic Integrated Circuit (PIC) presents tremendous cost reduction potentials. Scantinel Photonics CMOS compatible technologies allow highly scalable manufacturing ability to significantly reduce the unit cost.

"The first LiDAR demonstrator based on 5D+ full solid state will be available by mid of this year" added Dr. Michael Richter – Managing Director of Scantinel Photonics. "The ultimate goal in the automotive sector is autonomous driving. Our FMCW lidar technology brings us closer to that goal."

ZF Buy Into StradVision for Mobility in Bad Weather

DRIVER ASSISTANCE NEWS



ZF have acquired six per cent of the shares in StradVision, a South Korean software company specialising in image processing with artificial intelligence for automated vehicles and ADAS. StradVision software enables objects such as other vehicles, lanes, pedestrians, animals, traffic signs and lights to be detected and identified even in difficult weather conditions or poor lighting. The software relies on perception algorithms based on deep learning, which require relatively little memory and consume little energy. ZF say it can be adapted and optimised for a variety of different hardware platforms.

The StradVision software is already being used in large numbers in assisted and autonomous driving vehicles. ZF's head of electronics and ADAS development Marc Bolitho says "Together with our sensors, our middleware platform and our high-performance computers, StradVision software is a key component for perceiving the environment of automated vehicles such as shuttles or commercial vehicles".

Cariad Buy Intenta's Automotive Division

DRIVER ASSISTANCE NEWS

Volkswagen Group software company Cariad have acquired the automotive division of Intenta, where more than 100 experts work on sensor data fusion. With this expertise, Cariad hope to accelerate the development of assisted and automated driving functions up to L4.

Completion of the acquisition is expected towards the end of this year and is still subject to approval by the relevant antitrust authorities.

The fusion of the various data coming into the car from lidar and radar sensors; cameras, navigation, and in-cabin monitoring plays an important role for automated driving functions. Merging and overlaying all these datastreams creates a reliable image of the environment. This enables the vehicle to recognise objects in its environment, interpret their movements, and move safely and automatically in its surroundings.

The Intenta buy comes after Cariad's acquisition last year of the camera software division of Hella Aglaia.

Intenta, a young and innovative company, develop and market a smart sensor-based product range, and offer algorithm development services.

Huawei Disclose Camera-Radar Fusion Patent

DRIVER ASSISTANCE NEWS

Chinese information and communications technology company Huawei have disclosed an autonomous driving-related patent that integrates cameras and radars. The system includes a camera, at least one radar, and a processor.

The method proposed by Huawei integrates the two sensors—the camera and the radar—and fuses the obstacle distribution information from the two sensors. After the fusion, the drivable area of the vehicle is represented in the form of probability. Therefore, the information of obstacles around the vehicle can be comprehensively obtained, and the detection blind area caused by the blind area of the camera device or the detection range of the radar can be avoided.

The proposed method's steps:

1. Use a neural network to process the image data obtained by the camera to obtain the first probability distribution of obstacles,
2. Obtain the second probability distribution of the obstacle according to the echo time and echo width of the radar echo signal, and
3. According to these first and second probability distributions of obstacles, obtain a drivable area of the vehicle.

Huawei have published 54 patent information related to autonomous driving.

General News

Hella Report Sales, Profit

GENERAL NEWS

(IMAGE: HELLA)

Hella showed a successful performance over the first nine months of the fiscal year 2021/22 (June 2021 to February 2022) in a rough market environment marked by a significant decline in light vehicle production as a consequence of massive resource shortages. Currency and portfolio-adjusted consolidated sales decreased only slightly by 0.9 per cent to €4.6bn, while the adjusted EBIT fell to €238m (5.1 per cent) from €373m (8 per cent). The lower profitability is primarily attributable to rising cost burdens as a consequence of component shortages, higher prices for energy and raw materials, as well as a higher level of capital expenditure on research and development.

Hella confirmed their outlook adjusted at the end of November 2021; great risks and uncertainties arising from Russia's war on Ukraine; resource shortages, and on running consequences of the coronavirus pandemic.