LIDAR

A Lidar Community is Born

APRIL 6, 2022 · 2 MINUTE READ · 10 VIEWS

All of us at Driving Vision News (DVN) are proud to announce, with this first newsletter, the launch of a community for companies active in the automotive lidar ecosystem. Community members and invitees include automakers; suppliers; lidar specialists, researchers, and experts; component and testing suppliers, and all other contributors to automotive lidar.

Since 2008, DVN has been a strong and growing vehicle lighting community of currently more than 185 companies. DVN supports the development; commercialisation; thoughtful and appropriate regulation, and market uptake of good vehicle lighting. DVN activities include evaluating and sharing market and technology trends; discerning and assessing emerging technologies and markets; analysing and evaluating relevant developments, and attending and reporting on congresses and shows. Dissemination channels for all this DVN information include the weekly DVNewsletter as well as periodic reports and thoroughgoing studies. Perhaps most centrally of all, DVN produces an active schedule of Workshops to productively bring together the community's experts. These events have been ongoing since 2008 on a global basis covering the main automotive hubs: Europe; North America; Japan; Korea, and China. DVN events facilitate the formation of new relationships and the promotion of innovations as well as apposite standardisation and regulatory processes.

In 2017, the DVN team recognised that driving automation would clearly need lidar sensors as a core element to enable automated vehicles with L^3 and higher automation. Based on this insight and our experience in vehicle lighting, we decided to expand our community-building expertise to the automotive lidar market.

Since 2018, DVN has organised four annual conferences dedicated specifically to lidar and the increasing attendance along these four years confirmed that lidar attracts more and more interest in the industry. The last conference in November 2021 highlighted the need to set up an automotive lidar community. Many participants expressed their wishes to contribute to a platform for exchanges among lidar manufacturers; equipment integrators; sensors and components makers; test companies, and research institutes.

With that in mind, DVN this past February held a “think tank” with select stakeholders to evaluate the opinion about a DVN lidar community and important topics for such a community. The majority of the 25 participants welcomed the initiative and pledged further support.

So, welcome! Let us take the momentum and go on with our next think tank on 30-31 May in Frankfurt!

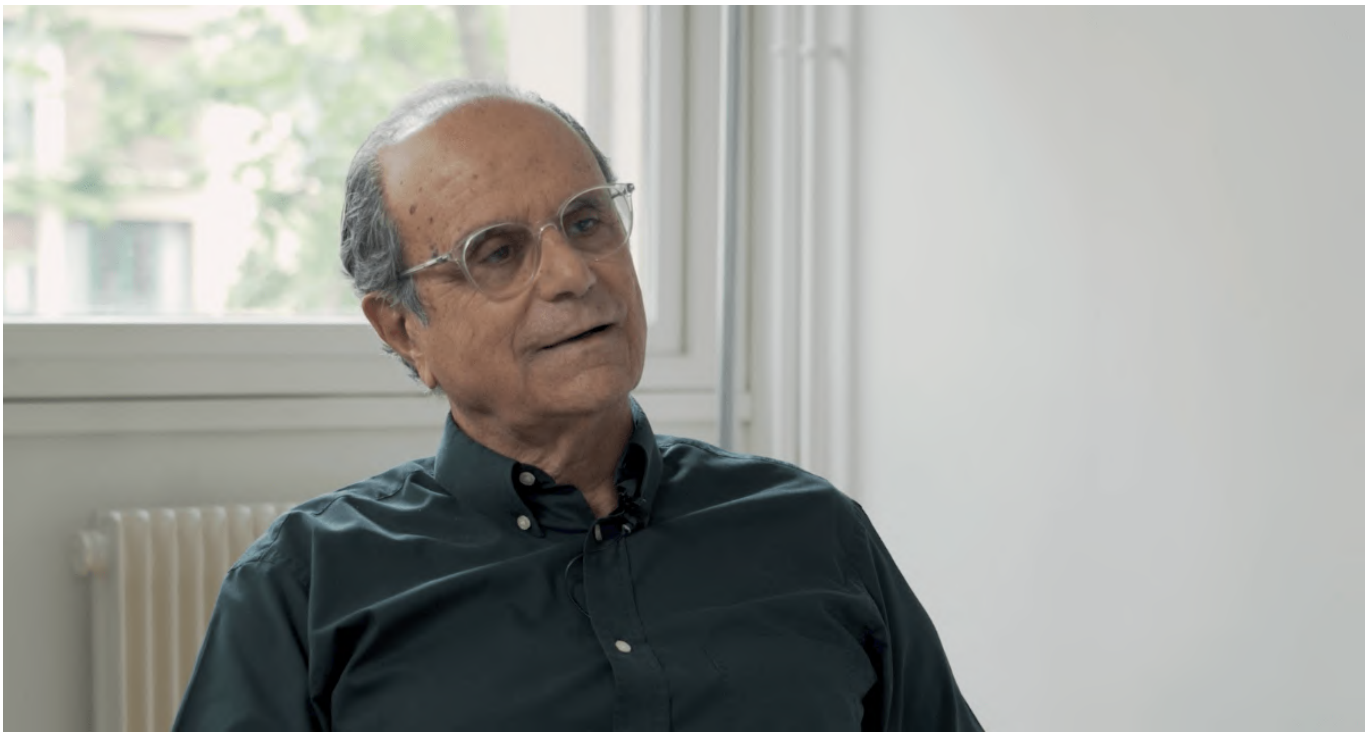
Alain Servel

DVN LIDAR ADVISOR
FORMERLY WITH PSA GROUP

LIDAR

Lidar Community to Learn, Promote, Network: DVN Founder Hector Fratty

APRIL 6, 2022 · 5 MINUTE READ · 37 VIEWS



The highly valued partner of this interview is Mr. Hector Fratty, former R&D director of Valeo Lighting; president of the VISION congress; founder and CEO of Driving Vision News—a unique organisation providing independent information about automotive exterior lighting and in-cabin equipment.

DVN : Hector, after your ambitious career in the vehicle lighting industry you have used your retirement to successfully found and grow Driving Vision News. Your worldwide DVN community currently comprises close to two hundred member companies—automakers; suppliers; research institutes, and universities. What are the key elements driving you to start a similar community for automotive lidar?

Hector Fratty:
Three key factors made me take the decision to include lidar in the DVN portfolio:

- Within the DVN team we observe the automotive market regularly, especially also with respect to driving automation. Therefore a couple of years ago it became clear to the team that lidar systems will evolve as a key contributor for ADAS and autonomous driving;
- From a technology point of view, automotive lidar systems have a lot of similarities with lighting systems, so synergies can be expected, and
- An integration of lidar sensors in vehicle front and rear lamps is a realistic scenario which can bring lighting and lidar players close together.

Therefore in my mind it made sense to evaluate this lidar segment and after our successful start with the first lidar conference in 2018 it was clear to me to further follow this technology.

DVN: You have deep experience with the vehicle lighting community. What were the key success factors to grow the community and to successfully contribute to the progress of vehicle lighting with the original DVN, and vehicle interiors with DVN-I?

H.F.: The first key success factor was to go slowly, seeking out real needs to serve. The first DVN Workshop was attended by fewer than 15 companies, just to understand their needs. Then—year after year, month after month, week after week—I work to fulfill their needs while better knowing them.

The second key success factor is to give real, cutting-edge, and accurate information. Many decisions could be taken partly considering the DVN news and it is important to have the trust of members. And last but not least, I strive to facilitate co-operation and relationship between DVN members not only by the global, worldwide workshops, but also through the DVN website and the DVN introduction from one to the other.

In summary, reacting to the needs of the members by true and impartial cutting-edge information and building contact between members is the paramount requirement for success of such a global community. This is the DNA of DVN.

DVN: What is the DVN-L offer to the members of the lidar community?

H.F.: In the context of our new lidar community, DVN proposes to answer to their needs comprehensively. There will be a monthly DVN-L Newsletter which will be sent to members to facilitate the carefully-focused flow of news to share crucial information about cutting-edge technologies and market development; interviews on specific topics and reports on industry innovation and progress, and announcement and reportage on DVN-Lidar events (as well as important other events). We will organise events—seminars and workshops—to facilitate live information sharing; to discuss common goals, and to enable networking.
And we'll back all of this with a sturdy communication platform for community members, in the form of the DVN website.

DVN: What will the DVN-L community contribute to the development of the lidar industry?

H.F.: Several studies emphasise the great future of the lidar business, but with many challenges to overcome for a broad market introduction. The target of the lidar community is to reduce these challenges, working together to break down the barriers, to prove to automakers and worldwide authorities the importance of lidar for safety. We will succeed only if we work together. Even though companies are in competition with each other, the common goal of a broad market introduction is a unifying element. Together it will be possible to form and grow winning, productive, rewarding relationships among component suppliers; lidar suppliers and supporters; tier-1s, automakers, and end users and society at large.

DVN: How do you expect to work?

H.F.: Our ambition is to create a leading communication platform to link the industry value chain; test houses; research institutes, and regulators. The main topics of interest should be use case definition and testing; promotion of lidar applications along the value chain and for the public; acting as a neutral intermediate to NGOs and the media, and related activities. It is crucial to have a diverse, representative mix of community members including automakers; tier-1 and -2 suppliers; regulators; researchers, and other interested parties.

Automotive lidar technology is in an embryonic stage and still developing fast. There are many companies involved, including startups, promoting a wide spectrum of different technologies and techniques. It is important for DVN to take a technology-neutral position to the maximum practicable degre. The largest investments made on automotive lidar are done in the U.S. and China, so we need to actively support the lidar ecosystem worldwide. China has the potential to adopt fast and in large volumes due to governmental initiatives linked to safety and accident reduction.

DVN: How are you organising this new lidar community?

H.F.: We started in November 2018, with the launch of a DVN Automotive Lidar Conference. In September 2019, we launched the first study dedicated to automotive lidar. Since then, we've kept organising conferences on automotive lidar, and this year in November 2022 we will organise already our fifth conference.
In February 2021, encouraged by the enthusiasm at the conferences and our experience in automotive lighting, the idea was born to create a lidar community and the "think tank" seminar organised in February 2022 was the real launch.

DVN: If you look some years ahead, what is your dream about the status of the DVN lidar community?

H.F.: I would like to repeat the success of the lighting community, but at a higher speed. Market developments as well as technology progress in the automotive area are much more disruptive than expected in the last decade, so the lidar community has to adapt to this pace. I see three elements as pivotal for a successful community:

- Common understanding of end-user and society needs to establish meaningful use cases for lidar systems; promoting and supporting a positive mindset in media and public;
- Pushing innovation for creating the best possible systems to satisfy the relevant use cases. This should include an integration of lighting and lidar where it makes sense, and I think there are ample opportunities.

- Wherever necessary, express a common voice of the community with respect to industry standardisation and regulatory bodies, interest groups, and other authorities on a global level.

> Thank you, Hector, for this interview. We wish the lidar community – and you, personally—all success!
>
> **DVN-L COMMENT**

LIDAR

Lidar "Think Tank" DVN Committed to Success of Lidar Community

APRIL 6, 2022 · 4 MINUTE READ · 52 VIEWS

About 25 participants from various parts of the automotive lidar world participated in a first meeting at the Dorint Hotel near Frankfurt, Germany. The list included Peter Zegelaar (Ford); Elias Marel (Volvo); Gregory Poillion (Blickfeld); Yang Ji/Rocardo Ferreira (Liangdao); Motohiro Komatsu (Koito); Guillaume Point (Stellantis); Achim Freiding (Hyundai); Ove Salomonsson and Hod Finkelstein (Aeye); Matthew Everett and Thomas Sommer (Lumentum); Jennifer Ruskowski

(Fraunhofer IMS); Jordi Castells (Nio); Clément Nouvel (Valeo); Unsal Kabuk (Huawei); Mario Brumm (Ibeo); Henri Haefner (Cepton); Dieter Gabriel (Velodyne); Clemens Hofmann (AMS Osram), and Christian Passlick (Auer).

After an introduction by Hector Fratty, a recap of DVN's lidar activities and ambitions for the new lidar community were presented by Leo Metzemaekers, Ralf Schaefer and Alain Servel. Three working groups discussed these topics and gave following results to

WG1: Benefits and needs of a Cooperative Lidar community

What does lidar bring for the car?

- Education: why are there so many systems? What are their benefits, drawbacks, and particulars?
- Benefits: what benefits does the lidar bring to the car? What are the use cases where radar and camera fail, what are the lidar requirements, what are the limitations?
- Regulation: use case without regulation does not make sense, need to shape it. What is the difference to the lighting community: lidar is new; what else?
- Many lidar companies exist with different level of "technological layer": Whom to work with
    - Companies can find partners to offer higher part of technology layer
- How to compare performance claims of different lidar systems / technologies.
- Align the chain of specifications, different languages within value chain—need translations.
- Automakers: Is there a bike next to the car? When to bring software into the community?
- Tier 1: Mechanical mirror or MEMS?
- Tier 2: how many pixels should my SPAD have, what power should my EEL have…?

WG2: Standardization, use cases and testing:

What will be the most frequent use cases with need for lidar in the next 3-5 years? Are there local/regional/global differences?

- Mobility needs
  - What are the applications that will define H volumes of Lidars?
  - Conditions are favourable. L^3–L^4 requirements determine where to invest
  - Next Regulations on AD will help
  - Needs in term of safety (see NCAP requirements)
  - City Traffic: Complex scenarios, obstacles can hide relevant targets; coöperative sensing (ITS)
  - Tesla crashes and lidar rejection could inspire action

- Which initiatives/actions are necessary to establish a standard for definition and testing of use cases?
- No Common inputs currently. Necessity to have a common KPI?
- Use cases have to be standardised
- What type of data (point cloud or objects) ?
- Automakers in China wants more details in data output
- What is the role of lidar in the context of sensors fusion?
- Automakers need to be helped; how could such initiatives be supported by the DVN Lidar Community?
- For Which use case are there limitations (radars; cameras, lidars)
- Promote lidar technology towards end-users

WG3: Promotion of safety and convenience benefits of lidar enabled functions

- **Promotion to safety organisations, example NCAP, IIHS or similar**
  - Define real world testing conditions
  - What are real world KPIs?
  - Make targets more realistic
  - Give inputs about use cases (example: ACC scenario with sudden entrance of motorbike)

- **Promotion to public media**
  - Common booth on motor shows like IAA
  - Public professional awareness through conferences
  - Invite influencers (ex: ADAC) to experience the benefits of lidar

- **End user approach**
  - Address younger people as early adopters
  - Address company cars as safety and convenience segment
  - Education to end user about Lidar to create trust in ADAS/AD
  - Convenience by visualizing (ADAS/AD) vehicle action to driver through Lidar enabled HMI

- **Styling appearance**
  - How Lidar can be positioned as styling element?
  - “I own technology!” as an adoption driver (China)

- **Miscellaneous**
  - Learn from DRL (lighting) adoption and project experience on potential lidar adoption case
  - Which elements (technical, financial, safety, society) drive lidar adoption for automotive

General Conclusions of the plenary discussion

To conclude this first seminar on this DVN lidar community and its possible roadmap, participants made the following suggestions:

- This lidar community might take in account needs from end-consumers and promote lidar towards end-consumers through associated members like automobile clubs (ADAC, AAA, CAA…).
- It might be a platform to create or enhance synergies between lidar actors and to share information.

- A good start is made with our community, already some level of trust and willingness to share has been created, the next challenge will be to put more meat on the bone. Four live events per year could be good as a start.
- The topic of styling differentiation for lidar has been addressed, in addition it is also worthwhile to investigate other differentiators made possible with lidar such as safe parking under any condition and other features.
- The topic of use cases could get more attention, also with stronger involvement of automakers.

All of us at DVN are committed to make a success of this community, and the DVN team will do our best to make it beneficial to all members.

We ask for your commitment and support.

LIDAR

Mercedes, Valeo on Drive Pilot L3

APRIL 6, 2022 · 3 MINUTE READ · 36 VIEWS

With Drive Pilot in the Vision EQXX, Mercedes-Benz last December received the world's first approval for an L^3 AD system under the UN Regulations recgonised by most of the world's countries—except on the American regulatory island. Now, they're pushing to get certain U.S. regulators onside.

In Germany, 13,000 km of motorway are approved for conditionally automated driving—which includes L^3. Mercedes-Benz are working to obtain approval from the authorities for the U.S. states of California and Nevada by the end of this year. Mercedes-Benz Group CTO for development and procurement Markus Schäfer says "In a first step, we are offering this world-leading technology to our customers in Germany, but will be rolling it out in the US as well by the end of this year if the legal and regulatory framework allows".

Drive Pilot uses the car's surround sensors already in place for the Driving Assistance Package, together with additional sensors the Mercedes people consider crucial for safe L^3 automated driving. These include lidar—it's Valeo's latest Scala system—as well as a camera in the rear window and microphones, especially for detecting flashing lights and other signals from emergency vehicles. There is also a wetness sensor in the wheel well. The S-Class with optional Drive Pilot also has redundant steering and braking systems and a redundant electrical system to ensure it remains manœuvrable even if a primary system fails, and enables safe handover to the driver.

Valeo's lidar technical product line developer Clement Nouvel talked with DVN-L; here are his thoughts:

DVN: You were at the Mercedes Drive Pilot demo event in Los Angeles to demonstrate Valeo's 2nd generation Scala lidar. What can you tell us about that?

Clément Nouvel: it was a fantastic experience as the only supplier invited to the event. I could experience Mercedes-Benz Drive Pilot level-3 operation in real traffic conditions, which is very impressive and incredibly fluid even in very complex situations, thanks to the S-Class' cutting-edge sensor set and proprietary vehicle control. On many levels, this L^3 is much more than any L^2 in operation today.

DVN: Could you describe the functions of the lidar in the Drive Pilot system?

C.N.: the Scala 2 lidar brings not only a 3rd redundancy sensor on top of camera and radars, but also an unprecedented level of perception—in all light conditions—of the environment around the vehicle. Scala 2 sensors include a full perception software stack which recognises objects and lane markings, as well as various functions required for L^3 operation. For example, Scala 2 can sense raindrops to evaluate the rain density and inform the vehicle accordingly.

DVN: And how does this 2nd-generation Scala system differ to the original?

C.N.: Scala 2 was meant to be an improvement over Scala 1, but has been redesigned from scratch to match stringent Mercedes-Benz requirements for L^3 operation. It delivers a wider vertical field of view (10°) and more layers—16, against 4 layers for Scala 1. It stands today as the reference sensor to meet the requirements of traffic jam speed L^3 on highways. Of course, its design is protected by a substantial number of patents.

DVN: Do you think we'll see Drive Pilot from other automakers soon?

C.N.: Strictly speaking, the Drive Pilot system belongs to Mercedes-Benz; only they can decide whether to extend it to other automakers. Scala 2 is currently in development for other automakers to achieve traffic jam L^3 operation, exactly like Mercedes-Benz.

DVN: Is it worthwhile to create a lidar community, like what DVN created for lighting?

C.N.: This is an excellent initiative. From multiple viewpoints, lighting and lidar have similarities. They are all active optical devices (emitting their own light), subject to eye safety requirements, similar regulatory organisations and principles, and both of them are part of the vehicle's design. A community makes a lot of sense the same way a lighting community has proven to be extremely valuable. In addition, these parts follow very similar constraints and may eventually merge as a single vehicle part—although this will most likely take a lot of time.

Valeo have done a great job with the lidar crucial to Mercedes Drive Pilot, and we are honoured to have had this interesting chat with Clément Nouvel.

DVN-L COMMENT

LIDAR

Ibeo's New Management Structure

APRIL 6, 2022 · 2 MINUTE READ · 41 VIEWS

L-R: CHRISTOPHE MINSTER; DR. ULRICH LAGES, DR. STEFAN GROS

Ibeo, a leading automotive lidar supplier, have announced a change in their management structure. The changes are strategically aimed at coping with the challenges of the quickly developing driving automation market and the important role which advanced lidar systems will play therein. In view of the expected future company growth and to safeguard the financial sustainability to grasp the upcoming business opportunities, it was decided to adjust the structure of the management committee.

Dr. Ulrich Lages continues as CEO, founder, and companion of the enterprise. In future he will be supported by Christophe Minster as COO and Dr. Stefan Gros as CFO. Lages says Ibeo's strategic goal is to position the company among the top three automotive lidar suppliers. He expects the new management structure—especially the competence in the financing and investment area—will be enhanced for long term sustainibility.

Minster joined Ibeo in the beginning of 2019 from ZF-TRW as program director for ibeoNEXT, the supplier's 4D solid-state lidar product. His education includes a bachelor of mechanical engineering as well as an MBA; he is an Alumnus of ESSEC business school. His experience is based on over 20 years' worth of sales; marketing, and operational positions at major automotive suppliers like Siemens, Valeo, and TRW. His ambition in his new role is to use his knowledge acquired over years to influence product innovation as well as sales strategy of Ibeo.

Dr. Stefan Gros has more than 25 years' experience in leading positions with a high strategic competence in various industries. Most recently, as a CFO and transformation officer he successfully guided the financial fortunes of international family-owned and public companies. He is a lecturer for business valuation and strategic corporate finance at the Eichstätt-Ingolstadt catholic university. Dr. Gros wants to contribute by his broad experience in finance to the strong growth of Ibeo in the lidar segment important for the mobility of the future.

With this new structure, the management—as well as key shareholders ZF Friederichshafen and AAC Technologies—feel well prepared for further developing existing business relationships and to evolve upcoming business opportunities in the automotive lidar market.

> **To push further growth of a company of the size of Ibeo in a very dynamic business environment, it is of key importance to have an agile management team. Therefore it seems logical to combine an experienced CEO with newcomers bringing valuable knowledge from other areas and companies.**
>
> DVN-L COMMENT

LIDAR

Lidar is Front & Centre on Nio's ET7...And its Promotion

APRIL 6, 2022 · 1 MINUTE READ · 33 VIEWS

Chinese electric car maker Nio have launched their luxurious ET7 model in select markets.

A remarkable aspect accompanying the launch is that the vehicle's lidar sensor was presented as a key technology item. The sensor is placed and carefully integrated just above the windshield. With the ET7 now on sale, Nio are ramping up the marketing, starting with promoting the car's lidar. The lidar for production vehicles is not for show, it is a lidar system that responds to the needs of L^3 and L^4 autonomous driving, a reliable complement to L^2. Nio even presented a video explaining the performance of ET7's lidar, which was developed with Innovusion. Nio's video does not introduce too much information, but Innovusion have previously disclosed that the lidar is a high-performance product, with a 120° ultra-wide viewing angle, that can detect objects at up to 500

metres' distance. According to Innovusion, the ET7's lidar has a laser wavelength of 1,550 nm, which meets human eye safety standards. The lidar has ultra-high resolution, enabling high-precision detection to better cope with complex road conditions and detecting small objects also at long distance.

The key element of this news is that a carmaker actively promotes lidar sensors, notably at the launch of a new model. The "world record" statements about the lidar system's performance are less relevant, as long as the installed lidar sensor contributes to road safety.

DVN-L COMMENT

LIDAR

Cepton are Exclusive Lidar Supplier for AutoDrive Challenge II

APRIL 6, 2022 · 2 MINUTE READ · 9 VIEWS

Several universities in the US have joined forces to support development and promotion of ADAS and autonomous driving, with dedicated education programs for students and a competition known as the AutoDrive Challenge. A dedicated team of faculty members and students take the challenge to develop an L^4 autonomous vehicle prototype that can navigate simulated real-life driving scenarios through various tests at Mcity, a state-of-the-art test ground in Michigan where researchers, automakers, and suppliers test smart mobility projects.

In this context, of course, lidar technology has a pivotal role as key success factor. As an official sponsor and the only lidar supplier in the program, Cepton will provide high-performance lidar solutions to the teams to enable their integrated systems. Cepton will also work closely with the participants to help them realise and apply lidar's capabilities.

Cepton CEO Dr. Jun Pei says "We are pleased to support AutoDrive Challenge II as a sponsor and the exclusive lidar supplier; we felt this program offered us a fantastic opportunity to help advance the lidar education in both the automotive industry and academia". SAE AutoDrive Challenge program manager Zac Pace says "We are happy to have Cepton as part of the new season of AutoDrive Challenge. This is the first time we will provide participating teams with directional lidars for their autonomous vehicles". And GM's AV lidar and camera technology engineering leader Erik Nordstrom says "Bringing together technology companies, solutions providers, and universities is key to ensuring that the AutoDrive program remains successful. Not only does the addition of Cepton help to make the program more rewarding for students, but will help enhance advanced technology curriculum and cultivate the next generation of technology leaders".

Through the AutoDrive Challenge II program, Cepton will be supporting teams from Kettering University; Michigan Technological University; North Carolina A&T State University; Pennsylvania State University-University Park; Queen's University; Texas A&M University; Ohio State University; University of Toronto; University of Wisconsin-Madison; Virginia Polytechnic Institute, and Virginia State University.

> **This is an attractive initiative to motivate students toward careers in the automotive industry. A great opportunity, too, for participating companies to engage strong talent for their enterprises.**
>
> DVN-L COMMENT

LIDAR

Velodyne Smart Traffic Watcher Wins Innovation Award

APRIL 6, 2022 · 2 MINUTE READ · 8 VIEWS

Velodyne's Intelligent Infrastructure Solution (IIS) won in the Smart Cities, Transportation & Delivery category at the South by Southwest® (SXSW®) Conference and Festivals. The SXSW Innovation Awards recognise and celebrate the most exciting tech developments in the connected world. The Smart Cities, Transportation & Delivery category honours innovations in eco-friendly or sustainable energy; transport; delivery, and Internet of Everything (IoE) technology.

Velodyne were recognised for their exemplary innovation; their IIS delivers traffic monitoring and analytics to improve road safety; traffic efficiency, and air quality. The system will help cities to plan for smarter, safer transportation systems. The concept is deployed in pilots under way in the U.S. states of Texas; Florida; Nevada; California; New Jersey, and Missouri, as well as in Canada. Among these is one in Austin, Texas— home of SXSW—where the city is using IIS to assess traffic conditions and identify proactive safety measures to help save lives. By improving traffic flow and reducing congestion, IIS will improve energy efficiency and reduce pollution and greenhouse gas emissions, as well. A first benchmarking implementation is now taking place at Rüsselheim, Germany, near Opel's headquarters (image).

Velodyne chief marketing officer Sally Frykman says "The SXSW Innovation Award provides further validation for the breakthrough capabilities of Velodyne's IIS in solving traffic and safety challenges. We are working with cities like Austin to help them achieve their Vision Zero goal of eliminating traffic fatalities and severe injuries. IIS allows cities like Austin to implement street improvements, policy changes and educational efforts that will protect vulnerable road users. IIS advances Velodyne's mission of creating smart technologies for a world in motion and their vision of science in service of safety".

Smooth, well-managed traffic flow is a key element to reduce negative impacts on society—time spent in traffic jams as well as pollution and greenhouse gas emissions. Though not directly linked to vehicle equipment, this initiative can broadly contribute to the benefit of society.

DVN-L COMMENT

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DVN Lidar Community Seminar is ON for 30-31 May!

APRIL 6, 2022 · 1 MINUTE READ · 28 VIEWS

Our automotive lidar community is gaining traction, and we are happy to announce that our second DVN-L Seminar is scheduled for 30-31 May. The event has substantial buy-in from key participants, and while the docket is still in development, as you can see we're including a robust mix of high-value elements, including three inspiring presentations on the subject of automotive lidar; a session on automaker requirement management; a Chinese perspective on developing lidar standards; detailed presentation of an Aachen University initiative on lidar testing and evaluation; discussion on selected topics in breakout groups, and—as with all DVN community events—ample provisions for networking including dinner; coffee breaks, and lunch.

This event will be moderated by DVN, and while of course we appreciate the benefits of live participation, we're also making provisions for online participation. Invitations are open to our lidar community members, and we look forward to another inspiring event to bolster support for development of the automotive lidar ecosystem.

To enquire on this event—or the DVN lidar community—please email DVN's **Geoffrey Lebrun** or **Alain Servel**.