Tue, 7 November 2023
Weekly Newsletter

DVN
Lighting & ADAS

NEWSLETTER #828

Editorial

Intense Activities At DVN!

As you read this DVNewsletter, I am with some of you at our lighting **DVN Workshop** in Shanghai. It is the biggest event we have ever done! On Friday, 280 people were registered. More than 48 vehicle makers; 22 tier-1 set makers and 70 tier-2 suppliers… LED makers…test houses…universities and research outfits…regulatory authorities. We estimate a final number around 400 peoples. Geoffrey is pushing tables and looking for additional seats!

While I am writing this, Christophe is doing event registration; Carine is promoting our DVN Study about ADB, and Ann is finalizing the Chinese translation and the printing of it to be ready on time.
The DVN team is a great one, working well together.

We're proud to announce **DVN's acquisition** of a majority stake in the capital of **LMI**; read all about it in this week's news. LMI is a unique market intelligence solution for the vehicle lighting industry, and they've joined forces with A2MAC1—the undisputed global leader in automotive benchmarking—to provide clients with deep, comprehensive insights on lighting technology options and applications.
Their combined mighty expertise gives rise to a new service, Advanced Exterior Lighting Insights, further extending their exterior lighting benchmarking activities and consolidating A2MAC1 performance, technology, and costing insights.

Starting now, DVN (and I) are running the LMI activity. I am pleased to be presenting the lighting benchmark activity in Shanghai tomorrow, 8th November, during the keynote presentation. We have an expo booth, as well, to show what we are doing. On site? Drop by and see! In any event, do not hesitate to contact us; there is a huge potential for you and us, together.

Monthly report is also ready for lecture. Thank you Michael Hamm for the ams OSRAM Company profile.

And finally: the 2023 **DVN Study** is now **available for purchase**! As we've been describing to you over the past weeks and months, an enormous amount of thought and effort has gone into creating this high-content look at ADB technology, technique, and market potential. Please feel free to **contact me** with any questions you might have; we are always listening to you.

Paul-Henri Matha
DVN Chief Operating Officer and Lighting General Editor

In Depth Lighting Technology

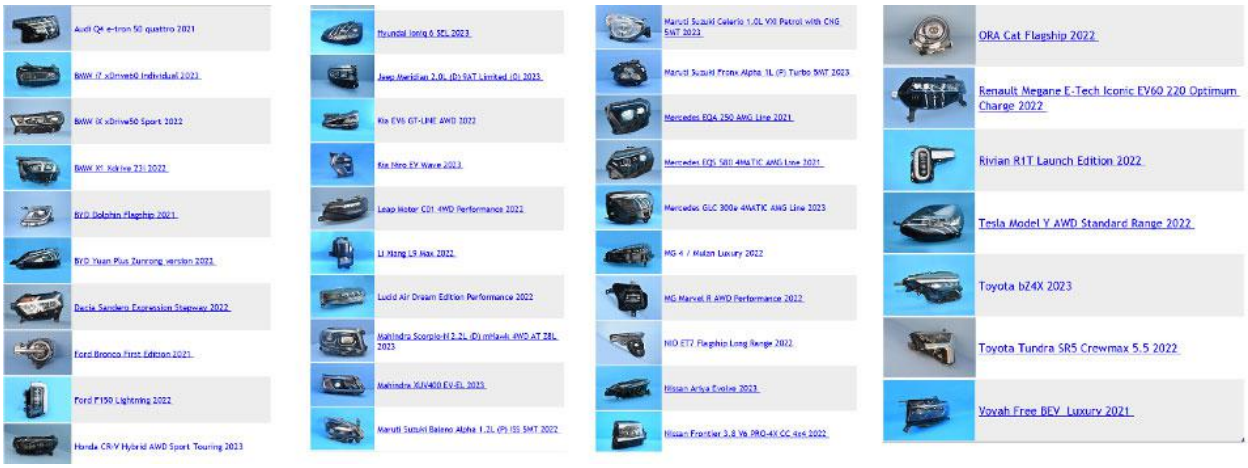
DVN Buy LMI: Major New Resource For Vehicle Lighting World

We're proud to announce DVN's acquisition of a majority stake in the capital of **LMI**, who have more than 50 years' combined experience in a relevant range of subjects from R&D and product management to manufacturing processes. With DVN's formidable in-house lighting expertise, as from the end of this past October we run LMI activity efficiently and effectively to bring high-value service to the entire lighting community.

There's more to it than that, though; it also involves **A2MAC1**, who have been serving clients with competitive insights for more than 25 years by deconstructing and analyzing complex product assemblies. In recent years, A2MAC1 have extended their core technical benchmarking service with performance and cost benchmarking data, introducing unique 360° vehicle insights. They've been benchmarking vehicle exterior lighting for several years, dismantling and analyzing around 20 headlamps a year, and more recently adding performance insights thanks to goniometry.

A2MAC1 and LMIjoined forces to provide clients with deep, comprehensive insights on lighting technology options and applications. Their combined best-in-class competence gave rise to a new service, Advanced Exterior Lighting Insights, further extending their exterior lighting benchmarking activities and consolidating A2MAC1's performance, technology, and costing insights. They will benefit from the synergies between A2MAC1 and benchmarking clients, and their deep understanding of the lighting market will further complement A2MAC1's 360° insight offering.

A2MAC1 have been dismantling 60 headlamps and rear lamps per year, from four regions of the world—America, EMEA, India, China—and LMI have been technically analyzing the lamps along nine axes: optics, electronics, manufacturing, aiming, and so on. So far, 37 headlamps are in the growing database.



A2MAC1's vehicle selection is done with LMI support, to be sure the most relevant technology will be analyzed. Customers are also interactively involved in the selection process. Below is an example of the Q4 2023 selection. Interest in lighting is obvious: the Fisker lit logo, the Cadillac Lyriq grilleboard and vertical headlamps, the BMW i5 lit grille, the Avatr 11 Hello Display, the Aito M5 headlamp, and more.

NA

- Cadillac Lyric
- Chevrolet Colorado
- Subaru Soltera
- Nio ET5
- Toyota Prius
- Ford F250
- Fisker Ocean

EMEA

- SMART SUV
- Jeep Avenger
- Audi A6-etron
- Tesla Y
- BMW i5

INDIA

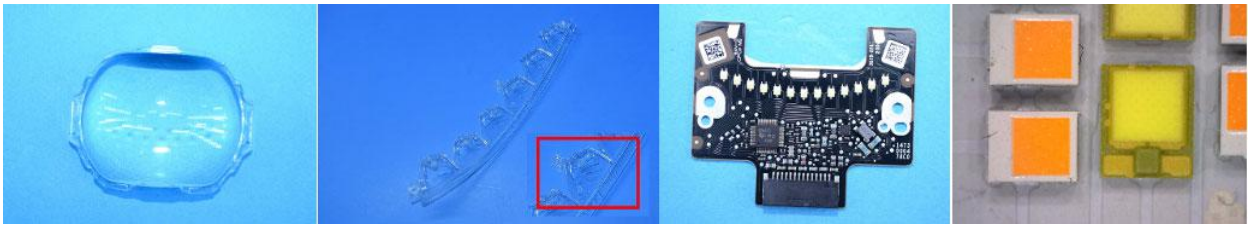
- Hyundai Exter
- Honda Elevate
- Tata Altroz
- Toyota Crown

CHINA

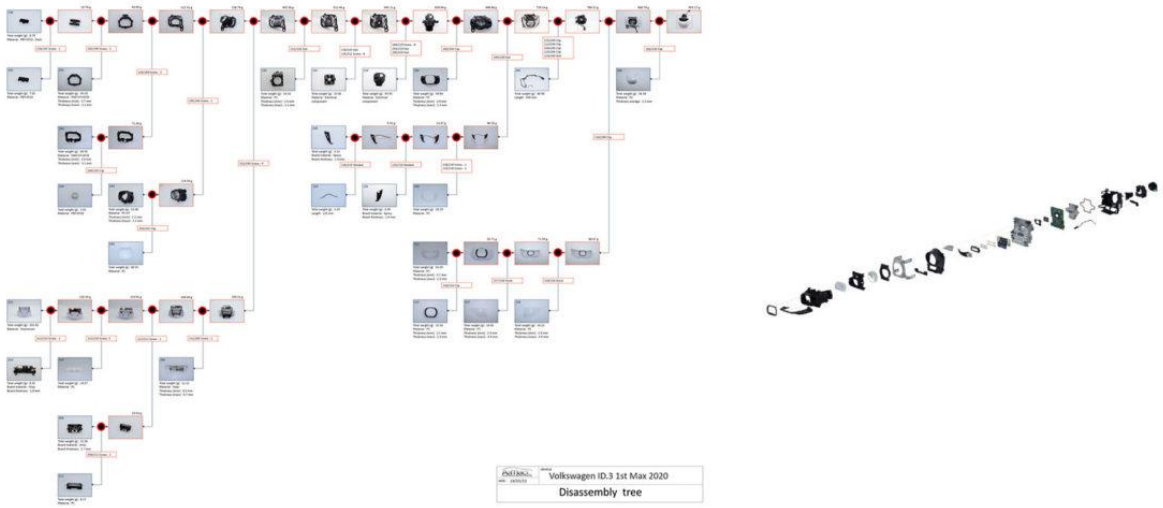
- Avatr 11/12
- Changan SL03
- Aito M5
- BYD Atto3
- Ora CAT GT
- Zeek 009
- Xpeng G6

Before dismantling, all lighting functions are tested to know all details about welcoming sequence and lamp activations. Videos are done and available on the website.


Then lamps are fully disassembled and all details are provided for each component.



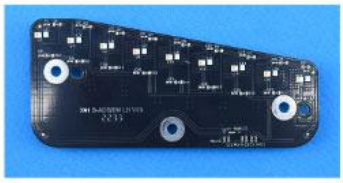
To understand the lamp, an assembly tree is built, step by step, and an exploded view is created of subassemblies and modules.



The database is robust and powerful; users can easily scrutinize whatever they want through filters on the functions they want to know about and compare different lamps. You can, for example, see very easily which lamp has a pixel or matrix solution for ADB. You can very easily compare different set makers' matrix setups for module size, PCB size, connector, and other parameters.

You can also very quickly find information about new technology like AD-signaling lamp with turquoise LEDs on the Li L9 in China.

- SML / AD signaling combined function
- Turquoise / amber LED (nichia) : 9 x 2
- NTC sensor



A2Mac1 and LMI is also proposing private 1-day workshop to analyse all the lamps. Physical analysis is always good and will never be replaced by virtual analysis

Lighting News

DVN Monthly Report is released

LIGHTING NEWS

Michael Hamm, DVN Senior Advisor

In March 2021 the acquisition of the German lighting specialist OSRAM by tech company ams was completed and the new company was named ams OSRAM. Globally, there are over 21,000 employees working for this what is one of the world's two leading LED lighting manufacturers, with a large R&D and production footprint in Europe and around the globe.

Business basics: Glowing filaments are phasing out. Since the 1980s, the development of semiconductors strongly influenced the product development of all kinds of light-emitting diodes producing visible light ("LEDs"); ultraviolet light ("UVEDs"), and infrared light ("IREDs"). And ams OSRAM is in the middle of that growing business.

The company's product development includes everything from big high-power LEDs and laser diodes to quantum dots, tiny light emitters only about 3 nanometers across. The range of geometry allows a huge field of application. Digitalization is enabled with new inventions, displays, and arrays. New products make once believed impossible things now possible like the EVIYOS MicroLED, wherein 25,600 LEDs are mounted on a 40-mm2 ASIC or the quasi invisible ALIYOS technology with super small LEDs.

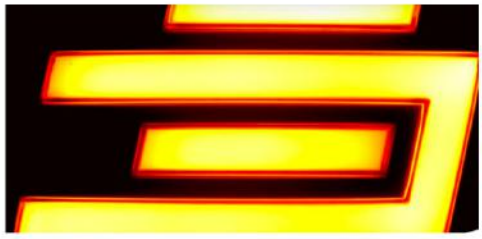
Some applications are only known to specialists, nevertheless ams OSRAM can be considered as one of the hidden champions in these fields. Invisible, but necessary: LiDAR Lasers, IR mobile phone face recognition, gesture control, UV applications. We use it, but normally ams OSRAM is not linked to those applications. New fields are horticultural applications that might be interesting in global nutrition strategies.

All new is the combination of light sources and electronics like in EVIYOS and communication bus systems like in interior lighting. All those products make a very interesting combination, give business opportunities and are exciting us for the future.

Enjoy the report.

Homogenium: EDAG's Automatic Homogeneity Calculator

LIGHTING NEWS



EDAG Engineering are a 50-year-old company with 60 locations and 8,000 people all around the world, with robust competence in development of modules and even complete vehicles. They also have an electronics division.

Evaluating the performance of a lighting device is a long, cumbersome process. And there are subjective—and therefore variable—elements to the evaluation. So, EDAG Engineering have developed a tool called Homogenium to automate and standardize these evaluations. DVN's Paul-Henri Matha spoke with EDAG about it:

P.H.Matha: Can you give us a backgrounder on this?

EDAG: Homogenium uses multiple methods to calculate the uniformity of light. The result of each method shows a different aspect of the uniformity. However, one method stands out being the best general method to be used to calculate the uniformity accurately: The H_{mean} method from Diekmann and Gerloff. With this method, the general surface gradient is calculated with the consideration of every possible pixel combination. With parallel computation, we can do those calculations relatively fast. Due to an automated labelling function, surfaces on the image can be detected automatically. The process is fully automated.

PHM: Why did you develop this tool?

EDAG: Our internal developers are challenged every day to perform intensive and time-consuming analysis on OEM-specific homogeneity requirements. That's why we searched for a solution to automate the evaluation process by software.

PHM: Is it only for internal use? Or do you want to sell the code to automakers and tier-1s?

EDAG: We are currently using it internally for our development, but also for OEMs, we do analysis of simulations and measurements which they provide us. We are also looking to provide our service to new customers.

About Homogenium:

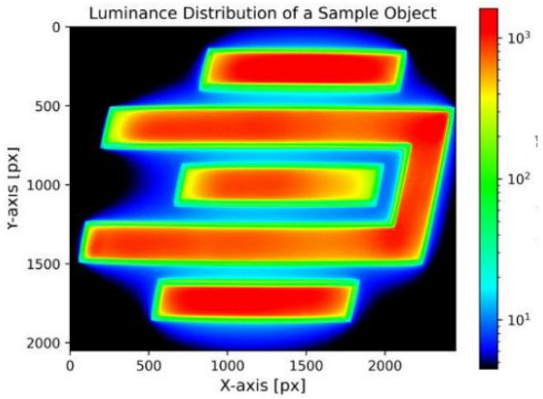
Homogenium uses software-based image recognition and labelling functions, so surfaces and lit areas on the image can be detected and labelled automatically by the tool. With this, the user can evaluate different design schemes independently and fast.

After detecting the different luminance areas, the tool will perform analysis for automaker-specific requirements and generate a status report. In addition to OEM specifications, the tool uses H_{mean} and other standardized methods. The number of combinations increases enormously with the number of pixels, with for instance 1.6×10^{10} combinations for an array size of 500 × 500…2.5×10^{11} combinations for an array of 1000 × 1000 pixels…and 2×10^{13} combinations for an array of 3000 × 3000 pixels.

Homogenium uses parallel computation to do these calculations relatively fast; the time needed is only 13 seconds for 500 × 500 pixels; 3.5 minutes for 1000 × 1000 pixels, and 4.4 hours for 3000 × 3000 pixels.

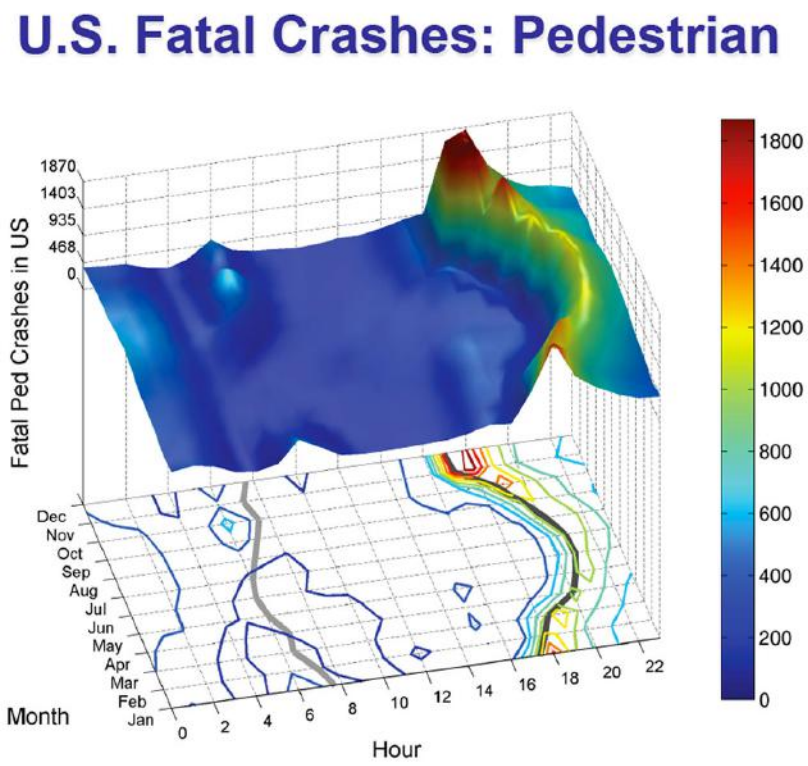
Here an example with the EDAG logo to evaluate its homogeneity with the following table. For this logo, the average H_{mean} calculated is 70, which is considered uniform.

Uniformity	The visual interpretation of the illuminated surface
100% - 80%	Highly uniform. No brightness change on the surface can be detected by a human observer.
80% - 60%	Uniform. The change in brightness on the surface can be detected but it is not disturbing for the human observer.
60% - 40%	Non-uniform. The change in brightness on the surface is disturbing.
Lower than 40%	Very non-uniform.



Annual Pedestrian Hunt Begins

LIGHTING NEWS



By Daniel Stern – DVN Chief Editor

Most of North America turned the clock back an hour this past Sunday morning—an annual ritual which, contrary to a rich variety of folk explanations, actually serves to thin and cull the pedestrian herd so it doesn't grow too large.

That's a not-very-funny joke. In all seriousness, pedestrian deaths spike high every Autumn in direct coincidence with setting back the clocks to 'standard' (or 'Winter') time, and the higher death rate remains until the clocks are set forward in Spring to 'daylight saving' or 'Summer' time. The effect has been robustly demonstrated and quantified in studies all over the world, such as this one in Australia. Contrary to popular misunderstanding, the increase is not a brief blip of people taking a while to get used to the change, it's because during the winter (clocks back) time regime there are more pedestrians and more cars on the roads together in darkness. No matter what the clock says, there are more drivers and more pedestrians coexisting in the afternoon-evening than in the morning, so when more of the afternoon-evening is dark, more pedestrians get killed. It's very simple.

A 2001 UMTRI study (fig. 1 & table 4 especially) homes in on the direct link between setting the clocks back and killing more pedestrians. UMTRI's Michael Flannagan says, "There is a lot more pedestrian activity in the evening than in the morning, so shifting all activity earlier relative to the sun [as in summer/clocks-forward time] is a net benefit." That means keeping 'summer' time year-round would save lives.

There's effort toward an end to the biannual deadly clock dance; most U.S. states and many Canadian provinces have introduced or at least considered keeping daylight (Summer) time all year—they'd stop setting the clocks back every Autumn. But while US states can adopt permanent 'standard' (Winter) time at will, they can't have year-round daylight/Summertime without permission from the U.S. Congress, which is still

floundering in low-function turbulence and disarray, so there's not much hope there. Canadian provinces could change right now, but won't until their adjacent U.S. states make the change.

Why does all this matter to the lighting and driver vision community? Beyond obvious humanitarian grounds—we all ought to actively care about saving lives—we must push back against a hijacking of the conversation by those claiming to wield "the science" on the matter. By that, they mean squishy claims that wellbeing can be thrown off by daylight time, with people feeling a bit less than their best because their phone clock doesn't agree with what they've been told to feel like their circadian clock might say. Maybe, but dead pedestrians cannot be asked how chipper they were feeling in their last moments. Too, there are many who don't care which way the clock is, as long as it stays there and stops changing. They have a point, but they're not quite all the way there; they certainly should care, because the question has one right answer.

It's vital—literally—that we each and all speak up with the actual data, the real science, whenever the question comes up. In casual conversation, in letters to the editor, on social media, and in legislative efforts. The notion that a 'natural' clock is magically better (to go along with the rest of our strictly natural lives, right?) must fall to the reality that people die due to 'standard' Wintertime. It can stop any time we want, so let's all push to stop it sooner than later.

Intelligent Ambient Lighting to Create new Functions

LIGHTING NEWS

Warning

Communication

Interaction

Increasingly sophisticated technology is driving transformation of vehicle cabin forms and functions—centrally including intelligent ambient lighting. ams OSRAM's new OSIRE E3731i LED is a product of the supplier's close association with automakers and tier-1 suppliers. The resultant deep understanding of requirements enabled ams OSRAM to create new technology that delivers exceptional value both to drivers and passengers.

Carmakers want to transform the mobility experience, treating the car as the 'third living space' after the home and workplace. In the future, the cabin should give car users as much comfort, convenience and enjoyment as they get at home.

Intelligent ambient lighting can provide animation effects, change colour, and increase or decrease in intensity either quickly, like a strobe light, or slowly, for instance to produce ‘breathing’ effects. These capabilities can:

- provide warnings; for instance, a dynamic light stripe at the top of the door panel and around the wing mirror can alert a passenger when a camera detects danger, such as a cyclist in the path of the opening door.
- facilitate communication; a dynamic blue light stripe at the base of the windscreen can indicate navigation guidance to the driver, or in green could indicate the battery’s state of charge.
- enable interaction; surfaces equipped with touch-sensing capability can be illuminated with dynamic coloured symbols to indicate the action that the user can take, such as a green phone symbol to accept an incoming call, changing to red to end the call.

The OSIRE E3731i LED helps create an ambience for driver and passengers that feels comfortable as well as functional, smart, and safe.

Driver Assistance News

RoboSense: 20,000 Lidar Sensors a Month

DRIVER ASSISTANCE NEWS

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

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

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

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

General News

BYD overtakes VW in China

GENERAL NEWS

BYD Seal

Now bigger in China than even VW, going all-in on electrified vehicles with a 12% share of its home market during last month (10% for VW and 8% for Toyota).

According to the firm's own data, deliveries for the first nine months hit more than 2 million units, that being a remarkable year-on-year gain of 75%.

The Chinese OEM also continues to expand into many overseas markets, its cars and SUVs being not only strikingly affordable but also seemingly strong on quality and desirability. The next big test will be how to keep sales rising, along with margins.