Tue, 13 February 2024
Weekly Newsletter

DVN
Lighting & ADAS

NEWSLETTER #842

Editorial

Lightstyle Update From DVN: New Cars Of The Last Six Months

At the end of last month, Daniel Stern, Philippe Aumont, and I published our **CES 2024 Report** with personal insights and key takeaways. And today we bring you our second report in as many weeks: a **focus on the lighting** on new vehicles released between last June and last month.

Some of the main themes and trends:

- Floating and extruded lights,
- Slim DRLs with low beam / high beam
- Slim DRLs with low beam / high beam hidden in lower area
- Full-width stripes

- Robotic look
- 3D lens
- Illuminated grille
- Slim rearlight module


GAC Era Concept


Hyundai Santa Fe


Lexus LF ZC Concept


Mitsubishi DX Concept


Volvo EM90


KarToyota CHR

If you haven't already done so, please take a moment and **go vote** for the DVN 2023 Awards. We have already received more than 400 votes, and the deadline is tomorrow, 14 February. The results will be revealed during the Munich DVN Event. Hope to see you there!

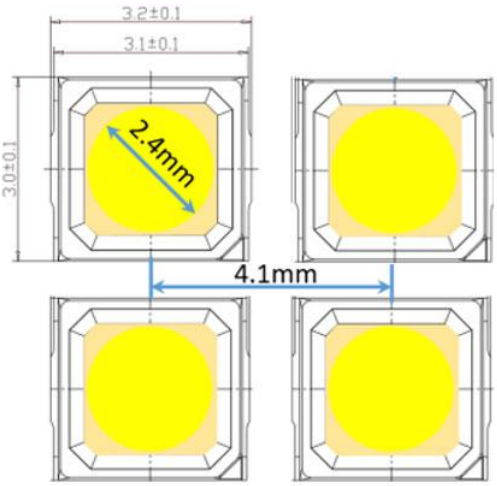
Paul-Henri Matha
DVN Chief Operating Officer and Lighting General Editor

In Depth Lighting Technology

DVN Interview: Liaowang's Dan Gu

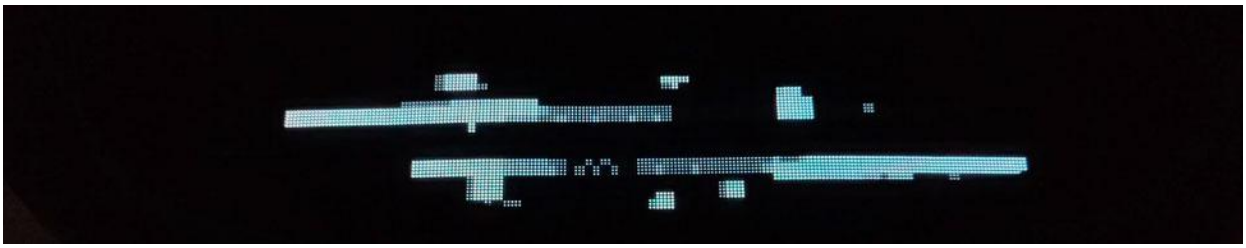
By DVN COO Paul-Henri Matha

Liaowang's products had some major stage time during the DVN Shanghai event. Avatr's Lighting System Product Development Manager Jing Wang presented about the Avtr 12 Halo screen—1.6 metres wide, comprising 10,500 LEDs with 4mm pixel pitch, it has CAN FD and OTA communication capabilities and can display text and patterns. It comes with 40 preprogrammed animations and messages.



And a presentation by Dan Gu, Liaowang's Vice General Manager, focused on the Avatr 11 and 12 Halo lamps.

The one in the 11 has 2 kilopixels at 10mm pitch, with a 60° viewing angle. Again, the one in the 12 is a 10.5-kilopixel, 4mm-pitch item with a fantastic 160° viewing angle and 32 greyscale levels—and it weighs 30 per cent less and consumes 70 watts, half the power of the 11 halo.



After the Workshop, I talked and listened with Dan Gu to learn more:

DVN: M. Gu, thank you very much for your great presentation. Will you tell us about yourself and your company?

Dan Gu: Firstly, thanks for your interview invitation. I am the Vice General Manager of Liaowang Group, and Director of the Liaowang Shanghai R&D Centre. Liaowang has established a research institute in Shanghai as the main centre, with Nanning, Liuzhou, and Foshan as auxiliary centres, forming a 'one institute, three centres' R&D system. Most of the time I work at the Shanghai centre. Besides, Liaowang has several plants, in Liuzhou, Qingdao, Nanning, Chongqing and Indonesia, supplying more than 5,000,000 products per year.

DVN: What can you tell about the optical system behind these halo lamps? What would a cross section look like?

Dan Gu: This is a really technical question. For the optical part, you cannot learn much from the section because we integrate the optical system into LEDs. LED is the core of our MDL technology.

DVN: This is a giant assembly, 1.6 metres wide. What kind of tooling machines and clamping forces do you need to make a lens for a lamp like this? How do you protect the polycarbonate; is it UV-coated? Filmed?

Dan Gu: We have the 1,700-ton Engel injection machine. We use a coating to protect the outer lens, just like the common method for the headlamps.

DVN: In your presentation you mentioned weight reduction. How have you achieved it? Which components were the focus for this effort?

Dan Gu: We decreased the weight of the lamp by modifying design of whole lighting system. We removed the main optical parts, such as the collimator and the light-blocking bracket; both are big and heavy.

DVN: Communication is CAN FD between the vehicle and this lamp; what about communication between the lamp ECU and the LEDs? What ICs control the emitters?

Dan Gu: We adopt SPI communication between ECU and LEDs. And we have several choices for LED IC, overseas or domestic origin. You know, different OEMs may have different requirements.

DVN: What will be the next step for the next iteration of lamps like this? What would you like to further improve?

Dan Gu: This is a good question. We are promoting sustainable innovation. For the next step, we're moving to higher resolution and RGB products, to provide better customer experience.

DVN: And what else are you working on? I understand you make rear lamps for the MG Comet EV…

Dan Gu: Yes, of course. We have a large customer base, including Changan, SGMW, IM, Aito, HiPhi, etc. More specifically, we provide the whole set exterior lamps for Aito M7, headlamp for SGMW Star, taillamp for Changan Deepal SL03 & S7 and Avatr 12. We also provide CHMSL, reversing lamps, rear fog lamps, and RR for the Changan CS15, UNI-K and others. It may take hours to introduce our products one by one.

DVN: Do you have plans to deliver and produce lamps in Europe or America?

Dan Gu: Some of our products has been shown in Europe and American markets with exported vehicles. And we are in contact with some European OEMs. We can deliver our products for Europe and America market, but we don't have plan of overseas plants yet.

DVN: We're looking forward to seeing Liaowang at the Munich DVN Workshop on 27-28 February. What do you plan to exhibit to European automakers there?

Dan Gu: We will take the Halo Lamp of the Avatr 12 and our HD module.

DVN: The Chinese market is evolving very fast, especially for exterior displays. What is your company vision about the trend? How do you see and foresee the lighting market evolving in China?

Dan Gu: Liaowang has launched globally leading MDL technology in 2023 and realized the mass-production in the Avatr 12 halo lamp. In the SAIC IM L6 taillamp, human-vehicle interaction has been achieved through MDL technology. MDL technology has been highly recognized by customers as a carrier for achieving human-vehicle interaction. The exterior display market is rapidly iterating and developing, from the initial timing animation to ISD technology, which has taken a few years. Now, MDL technology has become the mainstream direction of signal interaction products in the next 3-5 years.

DVN: Thank you for your time; I'm looking forward seeing you at DVN Munich event!

Lighting News

SIA VISION Call for Papers Deadline is Tomorrow!

LIGHTING NEWS

14 February is the last day to **submit your paper** to be considered for inclusion at the SIA VISION Congress—**V**ehicle and **I**nfrastructure **S**afety **I**mprovement **I**n all C**on**ditions—to be held on 16-17 October in Paris, France.

VISION is famous for its nighttime ride-and-drive demonstrations. For the first time this year, the congress will have a dual focus, with parallel sessions on lighting and ADAS.

Topical prompts in the call for papers are, for lighting:

- Sustainability: How do we define a safe and sustainable lighting system?
- Technology: HD, projections, light sources innovation to increase safety
- Lighting for severe weather conditions
- Lighting for sensor and sensor for lighting
- Design trends: lit grille, displays, charging lamp, welcome, personalization, interior lighting (too low or too much? How can we avoid safety impairment?)
- Vehicle lighting: trucks, bike, trailer, construction lighting
- Lighting regulation evolution

And for the ADAS track, topical prompts are:

- Perception: sensors (camera, lidar, radar, interior monitoring) and software (AI, deep learning, sensor fusion); HD maps, adverse weather (sensor disturbance, robustness, testing)
- Features (L^{2+},L^{3}, Valet parking, L^{4}, robot taxi, V2x)
- Regulation, ratings and norms
- Methods and tools
- Perception performance, sensor integration, sensor cleaning, repairability, life cycle assessment, power consumption, aftermarket, calibration

Alexander Stuckert is Newest Proud TUD Lighting PhD

LIGHTING NEWS

Alexander Stuckert successfully defended his dissertation, "Near-field Projection as an Adaptive Driver Assistance System—A Technical and Human-Oriented Consideration for Future Traffic Scenarios". The research highlights how direct visualization can serve as a means of communication between vehicles and other road users, such as pedestrians and cyclists. This innovative use of projection technologies can make a significant contribution to improving road safety and the introduction of highly automated vehicles. The successful completion not only marks a personal milestone for the researcher, but also a significant advance in the development of projection-based driver assistance systems. Stuckert conveyed thanks to the examination board, consisting of Professors Khanh, Neumann, Steinmetz, Adamy, and Frosch, for their contribution to the evaluation process.

Porsche's New Taycan

LIGHTING NEWS

New front and rear styling on Porsche's latest Taycan include new lights.

The new, flatter headlamps feature high-resolution LED HD-Matrix technology with detailed optics and the brand’s characteristic four-point graphics at night, too, not just during daylight via the running lights. The Porsche logo in the rear light strip features a three-dimensional, glass-look design. An illuminated version of this is available for the first time, featuring welcome/leaving animations.

Ford's New Puma

LIGHTING NEWS

The Puma is Ford's best-selling passenger car in Europe. Its latest update changes little on the design-and-style side, but the headlamps, with the puma's-claw running light signature, now have matrix LED technology.

Open a door and you'll see the Puma logo projected on the ground.

Lumax Launches Aftermarket LED Fog Lamps

LIGHTING NEWS

India's Lumax Auto Technologies, a diversified automotive systems and components tier-1 supplier, have launched a range of LED projector fog lamps under the Lumax Techmax brand.

Sanjay Bhagat, Senior EVP of the Lumax Aftermarket Division, says, "Our commitment to road safety is unwavering, and these fog lamps are a crucial addition, particularly during the winter season. Designed to be universally applicable, they greatly enhance visibility for all road users. By mitigating road mishaps, our fog lamps aim to deliver a seamless and secure driving experience, promoting a safer environment for everyone".

Lumax say the lamps—in 50 and 75mm sizes—offer Japanese technology and design, have 80-watt LED chips, and emit light through 800 metres. They are said to be fully sealed and waterproof, 'IP65 standard approved', and easy to install. They're available in 5800K, 4300K, and 3000K colour temperatures, described as "Kool Day Light", "Natural White", and "Warm White", respectively.

DVN comment

These fog lamps, as described, sound like a highly respectable technological achievement, given the 20- to 30-metre reach of most conventionally-mounted and -aimed fog lamps, and the extremely efficient heat sinking necessary to keep 80 watts' worth of LEDs from overheating.

General News

Volvo EM90 Production Starts in China

GENERAL NEWS

On 6 February, Volvo EM90s began emerging from the Geely Hangzhou Bay plant, where the Zeekr 001 and 009, the Jiye 01, and the Polestar 4 are also made. This plant's peak capacity is 300,000 per year, and last year 90 per cent of the cars coming from the plant were Zeekr 01s.

The EM90 is based on a Chinese car, and it is being assembled at a Chinese factory—so far for the Chinese market, where Volvo plan to start deliveries next month. So far, there has been no information about intentions for other markets.

The EM90 is 5,206L × 2,024W × 1,859H mm with a 3,205-mm wheelbase. It has six seats with a 2+2+2 layout, a new version of the Thor's Hammer front light signature made up of 16 ice cubes on each side, an illuminated circle-and-bar Volvo logo on the front grilleboard, and 21 Bowers & Wilkins speakers inside. There's a 200-kW electric motor on the rear axle, powered by a 116-kWh battery for 738 km of CLTC range. The starting price C¥ 818,000—about USD $115,000.

Renault's New Symbioz

GENERAL NEWS

Renault are readying their new Symbioz for release this spring. It's a C-segment crossover meant to slot between the Captur and Arkana in Renault's line of SUVs. The Symbioz will be sold only as a hybrid, with the same 143-horsepower, 1.6-litre gasoline/electric powertrain as in the Clio, Captur, and Arkana.

With a confirmed length of 4.41 m, the Symbioz promises 'generous space' and a curb weight below 1,500 kg—a fine figure in Paris, where parking fees have recently been tripled for vehicles weighing over 1,600.

The Symbioz is based on the Renault Group's CMF-B hardware, also underpinning the smaller Captur. The two cars share many parts, including the Renault Solarbay auto-tinting panoramic glass roof.

Despite the name, there's nothing in common between the new model and the large, grand-touring Symbioz concept car from 2017, which was fully electric and designed to plug into the home grid.

Volkswagen ID.7 is bigger in China

GENERAL NEWS

The Shanghai Volkswagen version of the ID.7 is longer and wider than the European version. While Chinese buyers have long favoured stretched-wheelbase versions of cars, this is not one of those; the wheelbase on both versions is the same: 2,966 mm.

But official figures released by China's Ministry of Industry and Information Technology have the Chinese car at 5,026 mm long, six-and-half centimetres longer than the European car's 4,961-mm length. Front overhang is 39 mm longer at 946 mm, and rear overhang is 1,114 mm compared to the original 1,088. Width is almost the same at 1,864 mm in China versus 1,862 in Europe.

L&T Tech Supports Marelli 'Digital Twin'

GENERAL NEWS

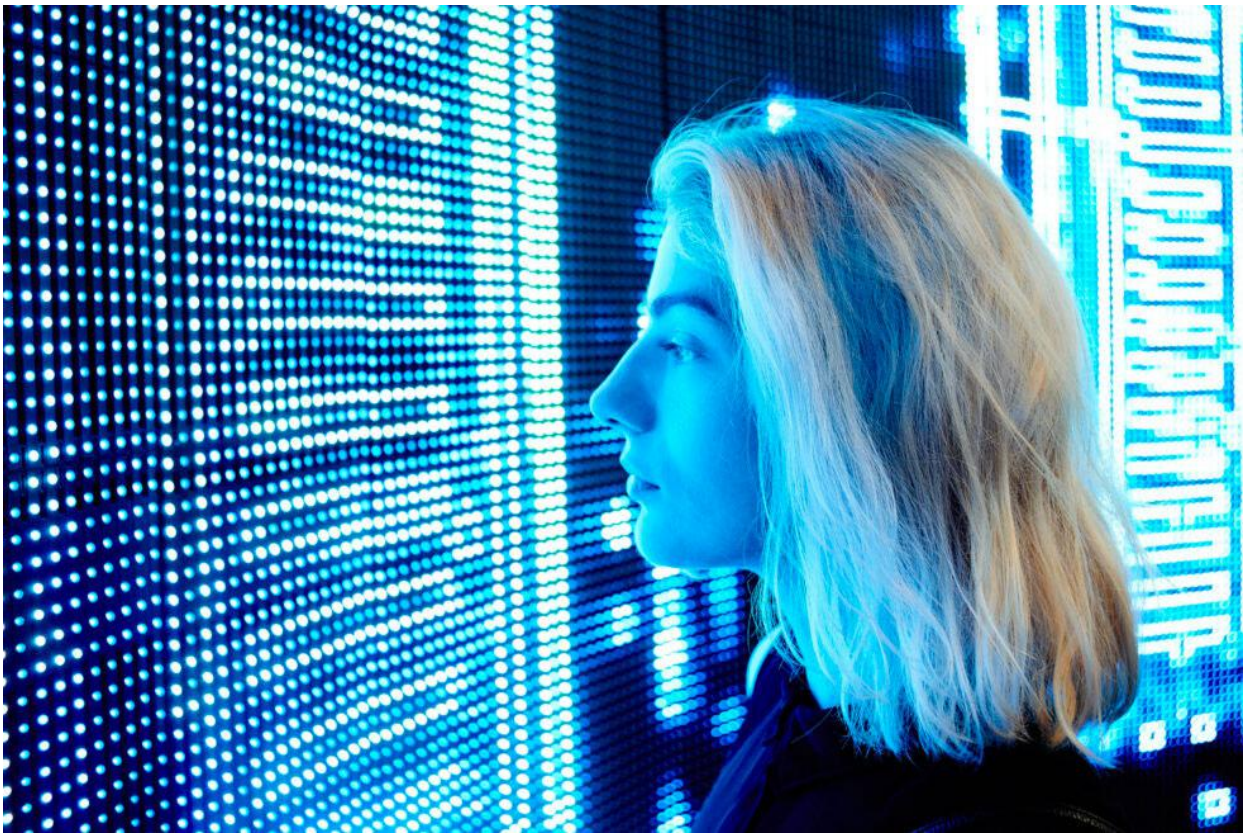
L&T Technology Services, a global digital engineering and R&D services company, support Marelli's information cluster design Digital Twin technique.

Built on Amazon Web Services, with the support of LTTS, Marelli's Digital Twin provides a virtual replica of the entire car's electric and electronic architecture—from information clusters to infotainment, and from zone control units to bodyworks. The Digital Twin streamlines software development and prototype creation, cutting costs by up to 30 per cent and development time by up to 70 per cent.

Digital Twin technology was showcased at CES 2024, and Marelli Electronic Systems' Head of Software Platform and DevOps Roberto Secchi said, "We are excited to join forces with LTTS in our ongoing efforts to enhance our Digital Twin. Marelli has become a key player in the SDV arena, thanks to our dedicated investments and the exploration of various business prospects, all driven by our unwavering commitment to innovation. Leveraging LTTS' capabilities will further boost our product portfolio, reinforcing Marelli as the premier technology partner for automotive companies".

MicroLEDs: Holy Grail of the Display Industry

GENERAL NEWS



Prof. Dr. Karlheinz Blankenbach, head of the Display Lab at Pforzheim University, recently shared his thoughts about the display industry.

While OLED panels are proliferating in an increasing number of applications, new technologies are zooming along as well. Professor Blankenbach expects a hard-fought race for dominance in display technology.

He notes the rapid market uptake of foldable smartphones with OLEDs, and improvements in OLED lifespan, transparency, and widespread use of locally-dimming LCDs, usually abbreviated FALD for Full Array Local Dimming. MicroLEDs are an epicentre of research and development strategy and development. Supply chains remain congested, and the fab utilization rate has risen sharply from a low in the summer of 2022.

Blankenbach is curious to see if OLEDs and FALD LCDs can establish themselves alongside automotive applications for industrial displays in 2024. Technologically, he sees the most excitement in the advances of microLEDs in terms of efficient and thus cost-effective production and applications. At CES, Samsung already introduced transparent large-format displays with this technology. These are brighter than OLEDs, with greater transparency.

Consumer electronic devices—smartphones, tablets, televisions—are "fully developed" in terms of development in the lower to mid-range price segment, which in his opinion is mainly about increasing yield. In the large-format high-end sector, which also addresses digital signage, the race between RGBW and RG quantum dots with blue OLEDs, usually abbreviated as QD-OLEDs, will remain exciting. The industrial

sector is partly determined by the fab utilization rate, for which a certain cooling effect is predicted this year.

As to the automotive market, industry has been setting the trends and thus the technical innovations for some time now. Examples include OLEDs, FALD, haptic feedback, and transparent displays.

MicroLEDs are the holy grail of the display industry, promising top performance in all relevant disciplines such as luminance, colour rendering, flexibility, and transparency. But a new display technology usually takes about a decade from consumer-electronics introduction to the availability of industrial products. Apart from the highest-priced digital-signage displays and the first quantities for micro displays, the leap of microLEDs into mass production has not yet been completed. This is also reflected in the respective production technologies of 'pick & place' and monolithic integration. Virtually all relevant large display suppliers have strong R&D activities towards an imminent market launch. The Apple Watch could be equipped with a MicroLED display for the first time as early as next year and thus give an impulse.

The race for the best industrial display technology is more open than it has been for a long time. In the past, it used to be simpler: first CRTs, then LCDs and, in the large-format area, a short interlude of plasma displays. About ten years ago, OLEDs conquered consumer applications; the technology has now also arrived in cars. LCDs countered with FALD, and microLEDs are up and coming. Bistable e-paper is following the energy-saving trend and can now achieve more than respectable successes in the digital signage sector, too.

Two More Cruise Incidents Under Investigation in California

GENERAL NEWS

The California Department of Motor Vehicles is investigating A self-driving Cruise car is said to have almost hit a 7-year-old boy who, with his family, had the right of way as they properly crossed a street in San Francisco last year.

NBC News quotes Sascha Retailleau, boy's father, as saying the car "was fully stopped, and then it started when he had gotten maybe a third of the way or halfway across the intersection" in the Mission District of San Francisco last August. "It started to accelerate towards us like we weren't there". Retailleau said the car swerved as it approached, right towards his young son Luke, who said he had to rush ahead to avoid being hit. The seven-year-old says "I felt scared. If I didn't run, it would have hit me, probably".

Cruise said they find no record of one of their cars encountering pedestrians at that place and time, but Retailleau, a mechanical engineer who has himself built robots, says he's sure what he saw that day: a driverless Cruise car with the company's brandmark orange stripe. He told NBC he contacted Cruise and gave them all the information they requested, but he is still waiting to hear back over five months on. "There was no apology", he said. "There was no 'we'll try to make this right'. Here is a company that is beta testing on the public".

That unpleasantness took place a day after a similar incident was **caught on camera** elsewhere in San Francisco: a Cruise car accelerated directly towards two women and two children in a crosswalk. The vehicle then brakes and swerves around them at the last moment.
Cruise's 400 driverless cars in San Francisco, Austin, Phoenix, and Houston has been off the roads completely since last October, when one of them hit and dragged a pedestrian, prompting California regulators to declare Cruise vehicles an "unreasonable risk to public safety". The survivor of that incident spent more than three months in hospital; Cruise recently proposed to provide more public information about future crashes and pay $75,000 in fines over the October hit-and-drag—less than 5 per cent of what the California Public Utilities Commission formally declared Cruise could be liable for.

Waymo Driverless Car Torched in San Francisco

GENERAL NEWS

A crowd surrounded a driverless Waymo car and set it alight in San Francisco on Saturday evening, 10 February.

Four videos **posted to Twitter** by a bystander show the incident in the city's Chinatown district. One shows people smashing windows with skateboards while the crowd shouts and cheers; the other shows people standing back from the burning car. Waymo officials say nobody was inside the vehicle at the time.

In **another tweet**, San Francisco firefighters say a crowd surrounded the car, broke its windows, and sprayed graffiti on it before lighting fireworks inside it, which started the fire.

It is not known what provoked the crowd to torch the car. San Francisco is an epicentre of autonomous-mobility research and development, but driverless cars have not met a uniformly warm welcome. Last year, objectors figured out how to immobilize a self-driving car by putting a traffic cone on the hood. And a driverless Waymo car hit a bicyclist in San Francisco on 6 February, causing minor injuries.