Thu, 7 September 2023
Weekly Newsletter

DVN-I
Automotive Interior

NEWSLETTER #177

Editorial

Interior Lighting At DVN Workshop: 3D For UX, Safety, Comfort

FORVIA IMAGE

The San Francisco DVN Lighting, Lidar and Interior Workshop was a great success last week, including a full session dedicated to interior lighting with lectures from Valeo, Forvia, Yanfeng, and Lumissil. This week's in-depth report looks at the highlights of that session. Interior lighting is evolving from a 2D perspective to a 3D immersive cabin where it supports UX, comfort, and safety. Static lights are giving way to dynamic lighting for distance control, warnings, etc. The idea is to contribute to safety by reducing driver distraction and give functional feedback to support warnings, systems updates, and alerts. Dynamic light fosters dynamic interaction—and that reflects the Deep Dive title “Interior Lighting and Beyond”, on which we will report in an edition to come.

Thanks to all speakers, exhibitors, and participants! We're glad you were there with us, and we're looking forward to welcoming you at forthcoming DVN events.

Sincerely yours,

Philippe Aumont
DVN-Interior General Editor

In Depth Interior Technology

Interior Lighting at San Francisco Workshop

DVN IMAGE

The DVN Triple Event in San Francisco last week included an interior lighting session, which featured lectures from Valeo; Forvia; Yanfeng, and Lumissil Microsystems. About 300 people attended the first-ever DVN Workshop on the US West Coast.

Valeo

VALEO IMAGE

Valeo started off with a lecture entitled “Interior Lighting Experience for Automated People Transportation”, presented by innovation and business development director Federico Pardo-Saguier.

Interior lighting comes in a new context as the driver becomes a passenger and vehicles change into a non-driver-centric environment. Lighting is evolving from discrete functional interior monochrome lighting

elements of the past into ambient lighting that has become part of the style of the vehicle's interior. Today we are transitioning from line illumination to surface illumination, and this is transforming the cockpit into a more immersive experience. That experience will be augmented when we step into projection and smart surfaces.

Pardo-Saguier cited an interesting study done with 3,000 people on what are their top three activities to focus on in a car, in Europe, the U.S., and China. People want to use this time to focus on entertainment and relaxing while in China they also highly value social exchange (audio or video calls).

Interior lighting has a role in safety, especially at SAE Level 3, where— in conjunction with sound and haptics —it plays a role into bringing the attention of the driver back to the steering wheel and driving tasks. And infrared light is crucial to DMS-OMS (driver and occupant monitoring) via interior cameras.

Lighting has also proved to play a role in car occupants' mood, and in mitigating motion sickness.

Interior lighting is now part of a complex system, supported by powerful hardware (LCUs, that is, lighting ECUs) and software. Lighting can also contribute toward eco-compatibility by dint of improved power efficiency, material end-of-life recyclability, and the use of organic elements (vegetal luminescence).

Valeo's California operations include a mobility technical center, set up in San Mateo seven years ago, with the objective of stepping up research and innovation; building close relationships with local startups, and developing partnerships with emerging new participants in the mobility realm.

Forvia

CARLOS ALTAMIRANO AT THE PODIUM (DVN IMAGE)

Forvia's presentation was called "Inspiring Mobility and User Experience Through Integrated Interior Lighting", and was presented by advanced surface-activation sales manager Maggie Kasper and interior lighting vice president Carlos Altamirano Martinez.

User Experience (UX) encompasses all aspects of human interaction with a vehicle. Usability is about avoiding usage problems and negative emotions such as frustration and annoyance through user-centered design. UX Design aims to create systematically positive UXs. Investment in usability or UX supports HMI design and necessary to execute during development process.

The Cockpit of the Future targets multi-use, adaptable space with focus on human interaction and well-being. The cockpit space will be transformed through sustainable surfaces, lighting, surface activation, enhanced seating capabilities and displays. Instead of only larger displays, the market is trending towards HMI with intent, de-stimulation, and functionality embedded into the Interior surfaces for reduced cognitive load, to provide a sustainable, usable, and calming atmosphere.

Dynamic light is one way to foster seamless communication between the vehicle and its passengers. It includes surface lighting and smart, dynamic lights for distance control, warnings, and suchlike. It contributes to safety by reducing driver distraction, with functional feedback via light for proper ADAS interaction, with animation capabilities to support warnings, alerts, and other information categories.

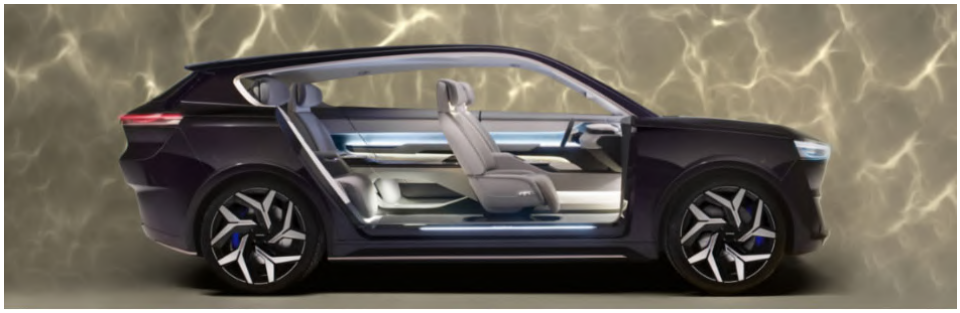
Integration of backlighting together with thermal system reduces time to sensation (it comes quicker), as temperature regulation is ranked one of the top interior consumer decision factors in the US. Surface heating uses less power than a standard heating system—nice for EV range extension.

Personalization and ambiance light come with human-centric, tunable light color temperature to create a 'feel-good zone'. Warm versus cool white light can have a psychological effect on eye and driving fatigue, wakefulness, attention, circadian rhythms, and mood. Yellow light is perceived as warm and pleasant; for relaxation

Functional light can reduce cognitive load by mixing touch-force sensing and providing passive and active haptic feedback. This also ties in with 'shy tech' to improve UX and create a calming interior, as it means users might be less overwhelmed by trying to find the controls for whatever function within a display.

FORVIA BOOTH (DVN IMAGE)

Yanfeng



YANFENG XIM23 (YANFENG IMAGE)

Yanfeng's presentation was “Yanfeng Experience In Motion: How Interior Lighting Can Enhance User Experience”, presented by lighting business development and engineering director Trevor Couture.

The talk was based on Yanfeng's XiM23 concept car. Ambient interior lighting is soft and airy. It shows, among others, the influence of interior light on UX, including safety. Light effects can be used to create mood through colors and æsthetic appearance. And light signals combined with sound are used to indicate danger in the blind spot.

Couture said lighting plays an important role in the XiM23: "(…) it helps us to create the right atmosphere in the cabin and spotlight design features, as in doors, floor console and instrument panel that look as though they’re floating. Lighting is also a communication tool, guiding the user on how to engage or control features as they go through each experience mode”.

Lumissil Microsystems

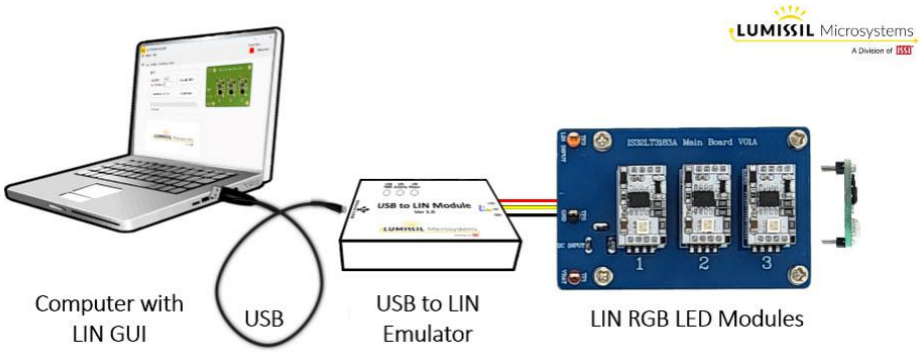
INAYAT KHAJASHA, JEFFREY MORIN, AND AARON REYNOSO (DVN IMAGE)

Lumissil's talk was called “Driving Towards Innovation: Illuminating the Automotive Market with Dynamic LED Lighting”. It was presented by LED driver technical marketing director Aaron Reynoso.

Lumissil is a division of Integrated Silicon Solutions Incorporated (ISSI). They cover technologies including touch sensors, audio, microcontrollers, power management, and connectivity, with the goal of becoming the best-in-class analog solution provider for automotive, IoT, and industrial markets, 'connecting to the analog world of light, touch, sound, power and control'.

They are a fabless manufacturer with established relationships at key semiconductor foundries. This enables their products to be innovative and cost-effective; while ensuring continuity of supply for customers. Regional Headquarters is in Milpitas, California, with offices in China, Europe, India, Japan, Korea, Singapore, and Taiwan.

Reynoso talked about Lumissil's latest automotive and commercial LED drivers, low power MCUs, application-specific processors, and other innovations.



LUMISSIL IMAGE

In a context where lighting creates awe and influences perception, interior lighting marks interior level ranges. Lumissil's LED product portfolio is based on RGB LED lights with integral LIN-compliant LED driver in an SOIC-8, with LIN transceiver and software. It allows performance for color accuracy and reliability, and all technical details were presented.

Interior News

Antolin, Vio Optronics in Integrated Display Pact

INTERIOR NEWS

Antolin have formed a new strategic collaboration with Via Optronics (video), a supplier of interactive display systems and solutions.

Via has grown into a global provider of display solutions and systems based on a proprietary bonding technology. They provide enhanced display solutions for multiple market sectors in which superior functionality and durability are critical differentiating factors.

The two companies intend to use their combined expertise and capabilities to design, develop, and produce innovative integrated display systems for vehicle interiors including cockpits, floor consoles and seat headrests.Additionally, the collaboration plans to jointly provide high-end solutions to automakers.

With the rapid advancement of vehicle technology, consumers increasingly expect intuitive and immersive experiences within their vehicles. Antolin and Via will work to provide next-generation display systems that seamlessly integrate into automotive interiors while offering enhanced functionality and user-centric features.

LG Display Automotive Partnership with Mercedes-Benz

INTERIOR NEWS

LG Display is strengthening their partnership and collaboration with Mercedes-Benz. The two companies started working together in 2004, and since then Mercedes have been equipping their cars with LG's advanced displays.

Given the existing installation history, it is not clear what will now change, but it is likely that we'll see more Mercedes models adopting high-end displays from LGD, mostly OLEDs. The Mercedes EQE 2022, for example, uses either a 12.8-inch AMOLED or (optionally) Mercedes' MBUX Hyperscreen, a 56-inch display, actually made from three different OLED units, embedded in a single glass display. There's a central 17.7-inch panel plus two 12.3-inch panels. The 56-inch glass also includes holes for the HVAC outlets, which are integrated into the display.

Minieye, Yanfeng for Smart Cockpit Technology

INTERIOR NEWS

MINIEYE TECH ADDS CARTOON NOSES, EARS, EYEGLASSES TO SELFIES TAKEN EN ROUTE (MINIEYE IMAGE)

Chinese intelligent-driving developer Minieye has entered a strategic cooperation agreement with Yanfeng for collaborative development and market expansion of intelligent cockpits.

The amalgamation of Minieye 's advanced technological capabilities with Yanfeng's deep-rooted experience in automotive manufacturing is expected to unlock new possibilities for automotive intelligence. The companies' shared objective is to devise technologies and products to facilitate the seamless interaction between automobiles and passengers, for a comprehensive and intelligent user experience.

Under the terms of the strategic collaboration, both companies will leverage their respective strengths to drive joint initiatives in areas such as smart cockpits, cockpit-driver integration, and intelligent interactions.

Yanfeng, headquartered in Shanghai, has at least 240 global branches and a history dating back to their founding in 1936. They specialize in automotive interior and exterior design, seating, cabin electronics, and passive safety. Minieye, founded in China in 2014, offers solutions including Seamless Entry, Child Presence Care, Fatigue Monitoring, Safe Handover, and Entertainment Space.

Elmos Lighting Conquers Car Interiors

INTERIOR NEWS

ELMOS IMAGE

Elmos makes automotive mixed-signal semiconductors, with special focus on future-oriented industries such as microelectronics, nanotechnologies, and IT. They've established themselves as an important science locus both nationally—in Germany—and internationally. They are experts in ambient lighting to transform vehicles into captivating spaces. This technology has evolved from a mere functional lighting feature to an experience that engages our senses and elevates our driving experience.

The Elmos lighting team is developing intelligent lighting systems and harnessing the full potential of ambient lighting. They take pride in leveraging expertise and the Elmos E521.39 LED Driver IC to assist automakers in innovating. Whether creating a relaxed and calming atmosphere or by incorporating light into instruments and controls, they become easier to recognize and navigate.

Dongfeng Peugeot-Citroën, Ecarx, Work on Tomorrow's Cockpits

INTERIOR NEWS

PEUGEOT 4008, CHINA-SPEC (PEUGEOT IMAGE)

Mobility technology provider Ecarx and Internet of Vehicles company China Unicom Smart Connection (CUSC) have been chosen by Dongfeng Peugeot-Citroën Automobile (DPCA)—a joint venture between Dongfeng and Stellantis—to supply Intelligent Cockpit 2.0 products based on the the Ecarx E02 intelligent cockpit computing module.

The module will be integrated into DPCA's new Citroën Tianyi, the Peugeot 4008 compact SUV, and Peugeot's 508L long-wheelbase sedan, which started mass production in August 2023.

The E02 is a high-performance, highly integrated core computing module designed for the infotainment systems of intelligent cockpits. For hardware, the E02 has energy-efficient intelligent cockpit systems-on-chip with 4G communication module and power management chips.

The E02 also enables and supports the development of a wide range of functions including data and information encryption, augmented reality navigation, facial recognition, T-Box (telematics box), quick start, intelligent voice assistant, multi-screen interaction, surround-view monitor and digital video recorder. In terms of display performance, the E02 enables independent display of up to four screens.

It has passed the AEC-Q104 auto-grade certification, denoting its ability to maintain stable performance in external environments while complying with stringent safety requirements.

New Škoda Superb, Kodiaq; New Interiors

INTERIOR NEWS

SKODA IMAGES

Ahead of their premieres scheduled for this fall, the interiors of the new Škoda Superb and Kodiaq have been revealed, their new dashboards providing a mix of modern and traditional elements. Although the two cars get a massive display, there are still real pushbuttons and real rotary dials with inbuilt small (1.253") screens. These are called 'Smart Dials' and provide access to various settings.

The functionality of the small screens depends on the level of equipment. The two outer dials control the interior temperature as well as the seat heating/ventilation for the driver and front passenger. The one in the center has several functions, including volume, fan speed, air direction, smart AC, map zoom, and driving modes. Pressing down on the central dial allows the user to switch between functions, and it can be configured through the infotainment menu.

The 2024 Superb and Kodiaq get a 13” touchscreen as well as a 10” digital instrument cluster complemented by a HUD. One of the most important changes compared to the outgoing mode is the position of the gear selector; it has been relocated to the steering column. That has let Škoda clean up the area between the front seats and improve storage.

The Superb is the one with the vertical fins on the dashboard and hidden air outlets, while the Kodiaq has more leather on the passenger side of the dash along with vertical air outlets. The LED ambient light strip goes below the central air vents on the liftback/wagon and over it on the SUV. Both have a USB-C port in the

rearview mirror as well as smartphone wireless charging at 15W, with the Kodiaq offering active cooling for two devices.

There's a dedicated area in the front door to store an umbrella. There are up to four USB-C ports with a 45W power output; an ice scraper; massaging seats, and upholstery made entirely out of recycled polyester.

The Design Lounge

Monsters, Inc.

THE DESIGN LOUNGE

1955 FUJI CABIN (IMAGES FOUND ON WEB)

By Athanassios Tubidis

Ryuichi Tomiya designed this, the Fuji Cabin, a fiberglass enclosed power-trike which made its debut at the 1955 Tokyo Motor Show. It was sold by Fuji Toshuda Motors of Tokyo in 1957 and '58; only 85 of them were made. The one shown here was sold by Sotheby's in 2013 for $126,500. The Cabin was the outcome of a design study addressing the crucial topic of mobility in urban areas, during postwar recession in Japan. It was conceived as a mobility solution, in line with the era and its financial events—a scooter with full weather protection. Maybe by pure coincidence, 2013 is the year that Eurozone experienced recession, forecast previously during the subprime crisis in 2008—the year of a major demographic milestone: for the first time, the global population outnumbered the rural population. This marked the advent of a new 'urban millennium'; it is expected that by 2050, two-thirds of the world population will be living in urban areas.

The thing about cars is that they enable freedom of traveling in a fully enclosed and protected environment while experiencing the surrounding scape. That narrative alone has brought about a cognitive and sensorial understanding of motion. Unlike campers, wagons or other itinerant forms of 'home', cars are self-contained units that embed the driving experience into the inhabited space and that is what sets them apart from everything else. Besides all objective parameters, cars have acquired a precise identity per market segment, like characters that played specific roles in our itinerant lives, expressing all our subjective lifestyle choices. Cars are expressive! In addition, on an ever-growing culture of mobility - as synonym to progress, social matters, economy, energy policies and legislation, merge all together into one commodity, the automobile.

It is difficult to imagine what a car would look like if we were to invent it today, but several contemporary parameters of great civic significance would have influenced its architectural composition and appearance. While all other Design objects, style-symbols of their era, have evolved in parallel and according to similar trends, cars have additionally acquired a special status in urban areas –today home to most people on the planet. Their overall size and engine would have to be refitted in the attempt to address the new mobility standards.

The Cabin has a single-cylinder, air-cooled, 2-stroke 121.7 cc engine, producing 5.5 bhp (4.1 kW) and giving a top speed of 60 km/h. That might have been a plausible future scenario for an enclosed-cabin, moving in a city center and, simultaneously a depiction of the future produced in an earlier era. Those were the exact specks of motion of the two passengers in the cabin of this one-eyed machine, 'missing' a headlamp and a wheel and a few extra cylinders compared to today's standard vehicles. Back then it was a peculiar design vision, founded on a specific context of strong socioeconomic priorities.

Nothing could fit better its character than Mike Wazowski, the lovable one-eyed monster from Pixar's 2001 animated movie, "Monsters, Inc". Wazowski is a scatterbrained optimist who dislikes arrogance and bad work ethics and finally wins the approval of his idols. A similar design attempt today would have gotten its place right next to Citroën Ami, Renault Tweezy, or Microlino.

Between the two eras, in terms of looks, we transitioned from James Dean's leather jacket and working-class jeans, to hippie culture and Steve McQueen's or Paul Newman's turtlenecks, and from a punk-rock æsthetic to Air Jordans and baseball caps, Livestrong bracelets and Boho vibes in the 2000s to different shades of millennial pink by 2010. The pandemic fashion of sweat-suits and zoom tops, followed by a '90s nostalgia, cottagecore and cabincore and the 2020s go on… I think the Fuji cabin could fit right in.

The Mike Wazowski of cars comes from the past carrying along codes of modernity, civic expression, character, and style as well as values that are extracted from a moment in time with certain similarities to the early 2000s. Today, as part of a private collection, in better-than-new condition, it is a significant, exceptionally rare vehicle in the microcar world and guarded as a precious relic of automotive, social, and economic history.

Rolls-Royce La Rose Noire Droptail

THE DESIGN LOUNGE

NETCARSHOW IMAGE

This is Rolls-Royce's third "Coachbuild" model, called La Rose Noire Droptail. Among its impressive, complex design features is a removable Audemars Piguet Royal Oak timepiece.

ROLLS ROYCE IMAGES

Designers replaced the vehicle's standard roof with a glass panel that can be transformed into a completely translucent roof at the touch of a button. Compared to other models, the removable roof is particularly low, for a sleek look.

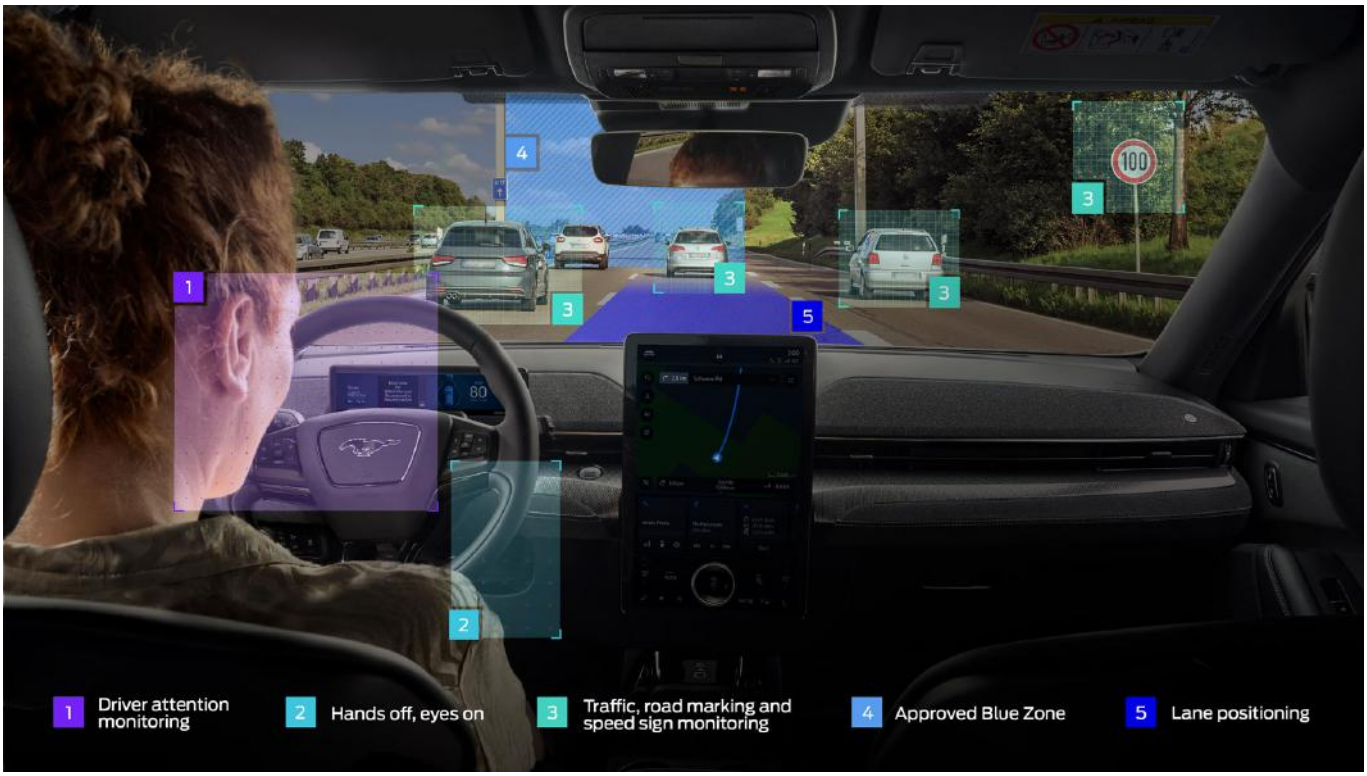
The car's cockpit consists of 1,603 wooden triangles built and hand-painted over a two-year period. The pieces were carefully placed inside to mimic the flight of rose petals. The exterior of the car, a deep burgundy red, was painted with five coats of clear lacquer, each mixed with a different shade of red. At the special request of the customer, a removable champagne chest appears in the rear of the car.

Perhaps the most striking aspect of the car, however, is not the new two-seat design or the impressive paint techniques, but the fitment of an Audemars Piguet clock. The Swiss watchmaker made a 43-millimeter custom Royal Oak Concept Split-Seconds Chronograph GMT Large Date, which is mounted in the interior. Rolls-Royce designed a special removable bezel so that the owner can take the watch out of the car and wear it on their wrist. The custom Rolls-Royce is worth USD $20m (€18.3m).

News Mobility

Ford First to Offer Hands-Free Driving in Europe

NEWS MOBILITY



FORD IMAGE

Ford is claiming to be the first automaker to offer hands-free automated driving on European roads with the introduction of their BlueCruise system.

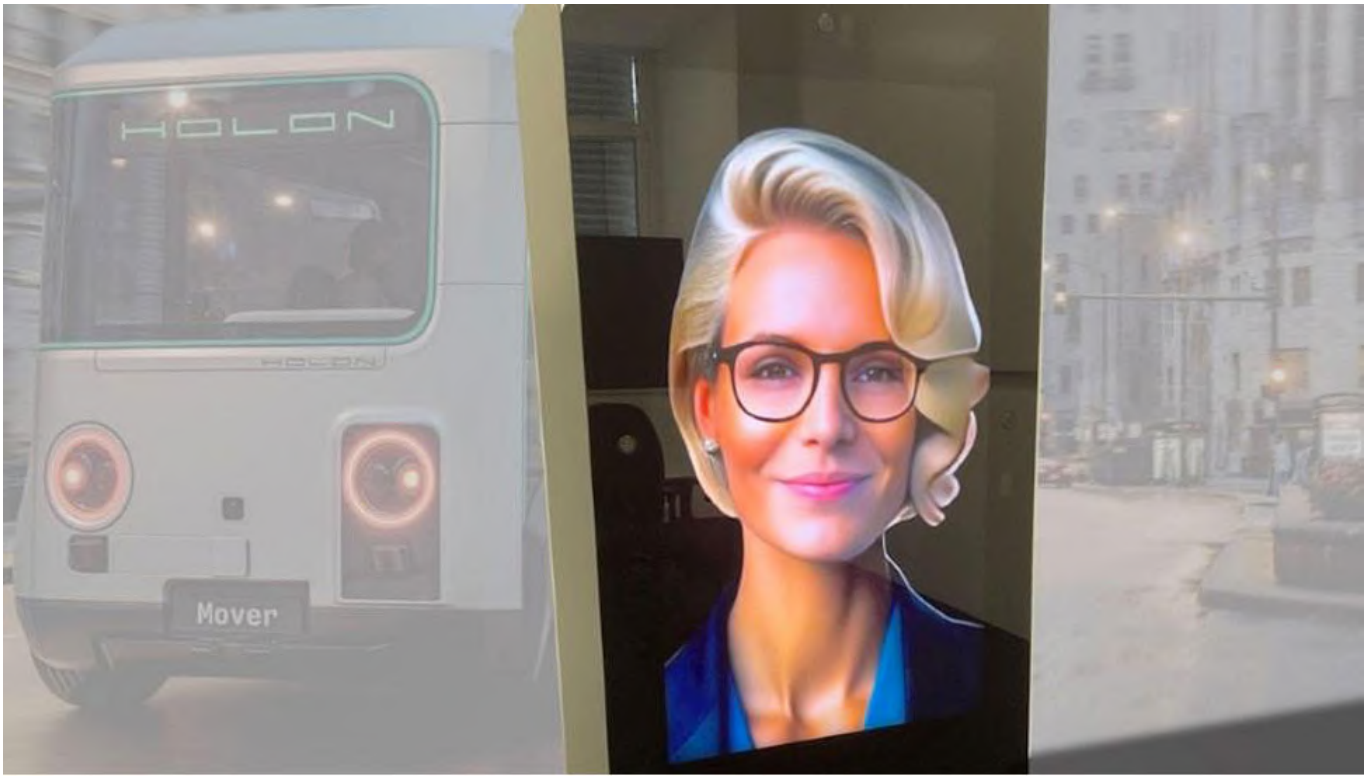
With permission from the UK's Department for Transport, drivers of enabled Mustang Mach-E models can use "hands-off, eyes-on" driving technology on 2,300 miles of pre-mapped motorways in England, Scotland and Wales, designated as Blue Zones. Ford's system monitors road markings, speed signs, and evolving traffic conditions to control steering, acceleration, braking, and lane positioning, as well as to maintain safe and consistent distances to vehicles ahead including down to a halt in traffic. Infrared camera technology inside the cabin checks driver attentiveness. Ford expects BlueCruise to be activated in further European countries, as and when regulatory conditions permit, and will roll out the system to further Ford vehicles in the coming years.

The news has received a cautious welcome from UK road safety and technology testing specialist Thatcham Research, and a warning that drivers will not be protected from any liability in the event of a collision while using the system. Thatcham vehicle technology specialist Tom Leggett says, "What makes it different, is that for the first time ever drivers will be permitted to take their hands off the wheel. However, their eyes must remain on the road ahead; we call this 'hands-off, eyes-on' driving".

He said it helps that the system cannot be activated until the driver monitoring system inside the cabin is satisfied that the driver is fully capable of staying alert and able to take back control should the need arise. Leggett points to the fact that BlueCruise's activation maintains liability in the hands of the consumer and that explains why it is first to market.

Cognizant Mobility's AI Driving Assistant

NEWS MOBILITY



COGNIZANT IMAGE

Cognizant Mobility has presented VERA, their 'Very Enhanced Road Assistant'. Using LLM (large language model), the smart assistance can understand and generate natural languages at a very high level. This should also help alleviate the fear of autonomous mobility solutions. In addition to the speech function, several cameras will enable proactive addressing of passengers and scanning of information to better consider the travel context during conversation.

The VERA is conceived as a driving companion which could be used in autonomous public transport or people movers in the future, to fill the gap left by the loss of real contact persons. It can provide driving information while interacting personally and individually with passengers. To do this, the AI relies on a vector database maintained specifically for the use case as well as 'prompt engineering' which helps the language model take the use case context into account as much as possible. In the future, the system is also expected to recognize medical emergency situations and thus ensure greater passenger safety.

Cognizant Mobility will present the VERA at the IAA Mobility in Munich early Sptember, using the example of the Holon Mover, which is being developed by a Benteler subsidiary in cooperation with Cognizant Mobility.

General News

LG Display Bolster Mercedes-Benz Partnership

GENERAL NEWS

LG Display is strengthening their partnership and collaboration with Mercedes-Benz. The two companies started working together in 2004, and since then Mercedes have been equipping their cars with LG's advanced displays.'

Given the existing installation history, it is not clear what will now change, but it is likely that we'll see more Mercedes models adopting high-end displays from LGD, mostly OLEDs. The Mercedes EQE 2022, for example, uses either a 12.8-inch AMOLED or (optionally) Mercedes' MBUX Hyperscreen, a 56-inch display, actually made from three different OLED units, embedded in a single glass display. There's a central 17.7-inch panel plus two 12.3-inch panels. The 56-inch glass also includes holes for the HVAC outlets, which are integrated into the display.

Top 10 Most Profitable Car Companies

GENERAL NEWS

DVN IMAGE

The world's largest automotive groups continue to grow significantly, according to a new evaluation. Compared with the same period last year, sales in the second quarter of the year rose by 18.1 per cent, while earnings before taxes (EBIT) grew by 31.3 per cent. Sales also increased by more than a tenth from April to June. That's according to an analysis published by audit and consulting firm EY. Here's the ranking:

№ 10: Volkswagen. They're currently working on the "biggest restructuring in decades". In the second quarter, VW increased their margin from 6.5 to 7.0 per cent.

№ 9: Mitsubishi. They reported a return on sales of 7.1 per cent, compared with 5.8 per cent in the prior-year period. Operating profit rose by 47 per cent.

№ 8: Suzuki. Margin of 8.3 per cent, compared with 7.0 per cent in the previous year. Operating profit grew by 34 per cent.

№ 7: Honda. Made strong gains in the second quarter in the U.S. market. The return on sales rose significantly by 2.7 points to 8.5 per cent.

№ 6: Tesla. They've cut the prices of their cars several times in recent months. Tesla's margin slumped to 9.6 per cent between April and July, down from 14.6 per cent in the prior-year quarter.

№ 5: Hyundai. They generated an operating profit in the second quarter, an increase of 42 per cent. The return on sales rose from 8.3 to 10.0 per cent.

№ 4: Toyota. Japan's largest automaker posted an operating profit of €7.5bn in the second quarter with more than 2.7 million vehicles sold. The margin grew by 3.8 points to 10.6 per cent.

№ 3: BMW. They increased operating profit by 27 per cent to €4.3bn in the second quarter. Return on sales rose from 9.9 per cent in the prior-year period to 11.7 per cent.

№ 2: Kia. They generated a 13.0-per-cent return on sales, compared with 10.2 per cent in the same period of the previous year.

№ 1: Mercedes-Benz. Management board chair Ola Källenius has focused the company on profitability with a luxury strategy. From April to June, the Group generated an operating profit of €5bn; return on sales grew to 13.0 per cent.

Constantin Gall, head of EY's Mobility Western Europe division, said: "Passenger car production is currently being ramped up, and the companies have managed to keep profitability well up.” Gall warned, however, that the time of these margins could soon be over for many automakers: “Once the orders from the chip shortage period have been processed, automakers will have to face the new reality of economic weakness, falling demand, price pressure, competition from China and overcapacity.”