Thu, 13 June 2024
Weekly Newsletter

DVN Interior

NEWSLETTER #216

# Editorial

## Holographics Heating Up


CERES IMAGE

HMI and HUDs play pivotal roles in enhancing the driving experience, safety, and overall usability of modern vehicles, it's a bit of a leitmotif in DVN Interior! Holographic technology was presented by Ceres Holographics at the Köln Workshop—all videos from which are now available for DVN Interior members and workshop participants; find them **here**.

DVN Interior wanted to go a bit further in understanding Ceres Holographic's technology is, and that's the scope of the interview I did at their location in Scotland a couple of weeks ago.

The interior news coverage in this week's newsletter builds on that interview—haptic technology from Touchnetix, touch-enabled HMI from Infineon, smart cockpit semiconductor from Rohm-Semidrive, P3/Mappo for new IVI, and more, all contributing to an enhanced driving experience through new HMI technologies. Getting the HMI experience right holds the key to delivering product and business benefits and ushering in the era of software-defined vehicles.

Thanks for being with us!

Sincerely yours,

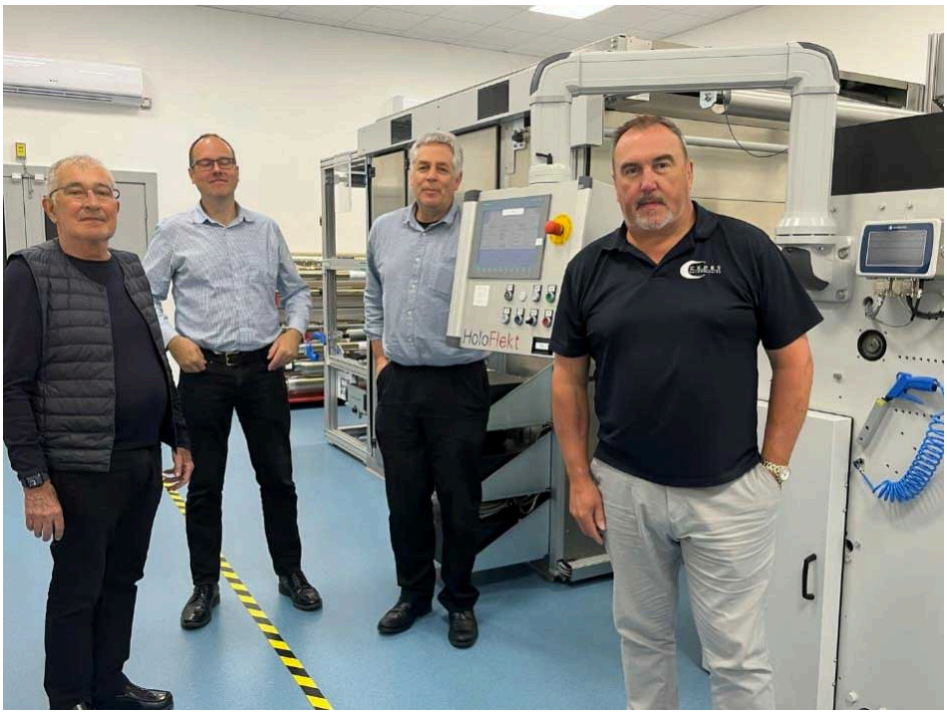
Philippe Aumont
*DVN-Interior General Editor*

# In Depth Interior Technology

## DVN-I Interview: Ceres Holographics' Digital Holograms


Ceres Holographics specialize in digital holographic mastering and hologram replication technology. Their innovative technology allows them to design, digitally master, and replicate holographic optical elements (HOEs) for transparent displays (TD) and augmented reality head-up display (ARHUD) systems.

Their business mission is to industrialize holography so as to create innovative designs, master holograms, and replicate volume holograms using their cutting-edge materials and equipment.




R TO L: CEO ANDY TRAVERS · OPS DIRECTOR FRASER MYRON · ENGINEERING DIRECTOR DR. ANDREW GRANT · DVN'S PHILIPPE AUMONT - (MISSING) GRAEME GORDON, DIRECTOR COMMERCIAL (ALL IMAGES CERES OR DVN)

**DVN-I: How did Ceres Holographics come to be?**

**Ceres:** It has been a long journey, 30 years of film development, starting in the '90s with a new photopolymer developed at Lucent (formerly Bell Labs) for holographic data storage applications, a spinoff event to commercialize that film at InPhase Technologies, and then investment from Bayer (now Covestro) in 2005 to commercialize that film for non-data-storage applications, and further develop this groundbreaking photopolymer to make it commercially available as Bayfol HX.

**DVN-I: What support did you have during development?**

**Ceres:** In the very early days there was initial seed venture capital, some grant, and some revenue from Bayer to help test the new photopolymer. Between 2014 and 2019, further seed rounds helped complete the development of the master printer technology and start the industrialization process. In 2019 we successfully won a European Horizon 2020 grant award to accelerate commercialization of the hologram manufacturing technology for automotive displays. The objective of that project was to extend Ceres' in-house, low-volume replication technology to copy master holographic optical elements (HOE) into the blank film, such that a viable manufacturing technology is available for industrial partners to manufacture higher volumes of holographic films in the large format film sizes required for automotive windshield integration. The support was worth £1.4m. The machine was completed and fully functional by 2021, and since then we have had continued venture capital funding from private family firms and from the Scottish Government to help advance our push into automotive. .

**DVN-I: Can you tell us more about the underlying science?**

**Ceres:** Volume holograms are a type of hologram whereby the recorded fringe patterns are embedded inside the film. These types of holograms are suitable for making holographic optical elements. They were originally recorded using DCG film (dichromated gelatin) which was never suitable for mass market applications due to cost of processing, although they were used in military HUD applications.

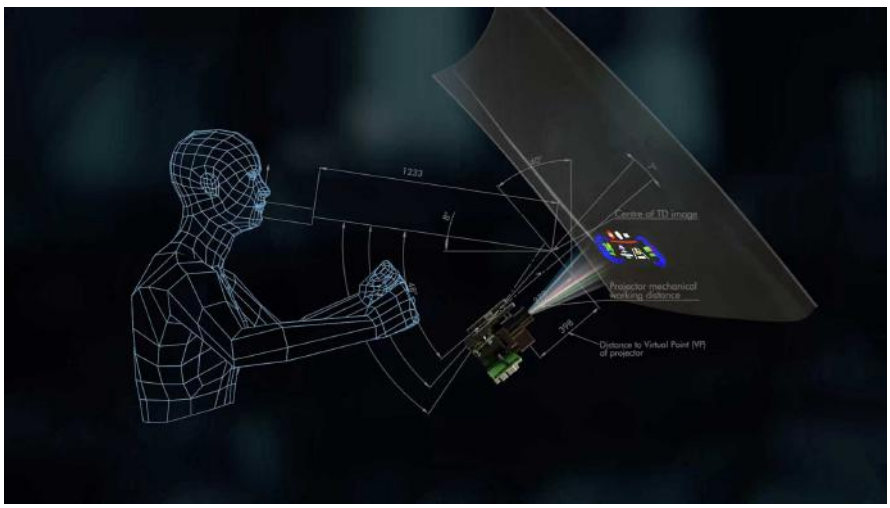
In 2006, Covestro paid InPhase for a license for the new film chemistry, and since then has invested over €150m to develop this Bayfol HX variety of the film, and optimize the film for full RGB performance and industrial readiness. Critical for commercialization, the recording processing with the film is a dry process with no by-products, and is very environmentally friendly as there's no addition of chemicals, and once recorded is very stable, so recorded structures stay for years.

Ceres additionality has been the build of the recording equipment to make the hologram masters and the replication equipment to produce millions of copies of the masters in new varieties of the film which contain this remarkable photopolymer. Ceres tested over 50 formulations and helped optimize Bayfol HX film for new automotive applications while optimizing its own holographic digital printing technology.

Ceres' master printer is loaded with one-pixel worth of data, and each exposure records an individual tiny HOE element in microseconds. This step is repeated until the full-size hologram is built up of millions of little holographic nanostructures stitched together, pixel by pixel.

In this way, the programmed film can become a diffuser or even a lens, where information (as in a HUD, like speed, navigation, etc.) is displayed with a projector, while the driver sees through the transparent film as if nothing were there .

**DVN-I: How important is automotive in your portfolio, and what is your product offering?**



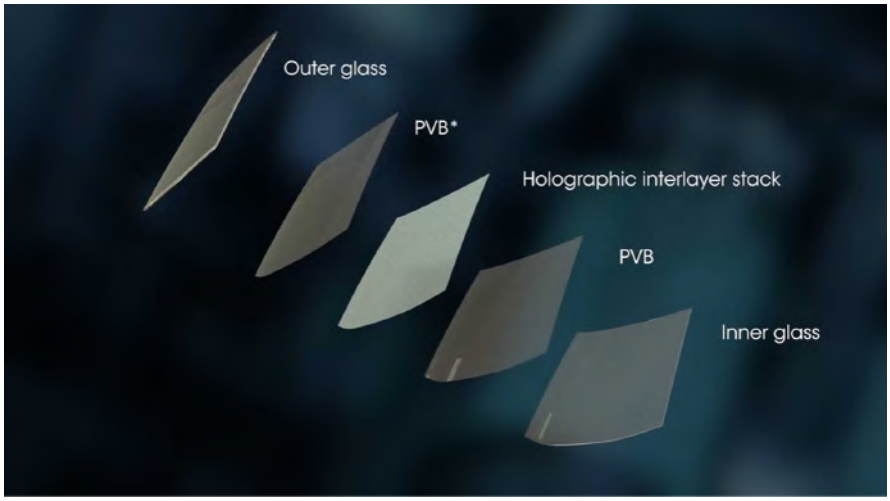
**Ceres:** Our beachhead market for our technology is automotive, transport, commercial trucks. But right now,automotive is concentrating all our efforts as we work towards first production starts with passenger car OEMs.

Our actual product offering is this transparent film for holographic display applications. HoloFlekt is the brand name for our films, and the brand name of Ceres large format (1,200-mm) R2R (roll-to-roll) film production technology equipment that enable the production of holographic films for transparent display, lighting, and augmented reality applications.

We actually started development projects with the first European OEM in 2015, and since then have been refining the product offering with multiple global OEMs.

Who will be first? 12 months ago I would have said it looked like it would be the US OEMs or the Europeans, as they have fully developed full in-car POCs (proofs of concept) which are prototypes with our films in industrially-laminated windshields. But recent strong demand from China could change all that—such is the pace of engagement.

We calculate conservatively that the initial transparent display market opportunity enabled by our HoloFlekt films is an expected value of €2.8bn by 2032 for Ceres and our supply-chain partners.




WINDSHIELD LAYERS

**DVN-I: What is your business model?**

**Ceres:** Ceres, under commercial contract, designs the optical system, and masters the HOEs for the specific vehicle display configuration. Right now, we produce the full-size films for our interlayer partner Eastman. But the final business model will see the HoloFlekt production equipment licensed to them or their partners in the windshield supply-chain. This simplifies the supply-chain economics and makes the total display cost more acceptable for OEMs.

Eastman has been critical in making this all possible by developing the final holographic film stack and interlayer assembly, which is then delivered to a windscreen producer. On the other side, an instrument panel supplier needs to receive and assemble the projector into the instrument panel before shipment to the OEM where the two parts come together.

**DVN-I: What are the benefits of your technology?**

**Ceres:** The real benefit delivered of this technology is being able to produce cost-effectively a multiple-screen display system in the windshield which benefits OEMs and their customers in terms of safety, comfort, and user experience.

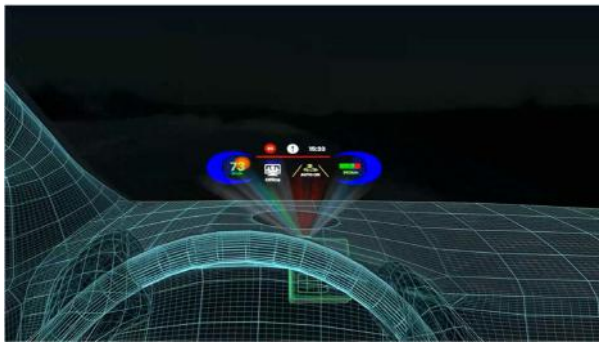
Our core technology relies on four pillars: the photopolymer film knowledge, optical system knowledge and HOE design, machinery to produce the master and then replicate in volume, and our partnership with Covestro (film) and Eastman Chemical (photopolymer protection and windshield interlayer production).

**DVN-I: What sets your tech apart?**

**Ceres:** It all starts with the film and HOE design, but our ability master the HOEs through a completely software-controlled printer is unique. Then, it is our capability to replicate in volume using the full-width roll-to-roll manufacturing technology and recover with the protective layers. Ceres' R2R machine has been running for three years, and has supplied thousands of meters of finished films to Eastman.

**DVN-I: Why are you located in Scotland?**

**Ceres:** It came from Dr. Ian Redmond, a Scotsman who did research in the US for holographic and optical expertise over 20 years and founded the company back in Scotland in order to pursue this new digital printing technology for hologram recording in photopolymer material coming from the holographic data storage industry. Scotland is remote from the main automotive hubs but thanks to Covid, working from remote has become a standard way of working during the design and development phases.



**DVN-I: What are the benefits of your technology for displays?**

**Ceres:** Ceres technology brings the main following benefits:

- The largest HOEs for large-area wide field-of-view HUDs.
- Excellent visual quality, with the highest brightness and uniformity.
- Configurability to adapt to different vehicle designs and requirements.
- Cost-effective solution thanks to multiple displays in a single film.
- Extremely small HUD projector package size – Potentially less than 1 liter.

**DVN-I: And how does the end-user perceive benefit?**

**Ceres:** Main benefit is in HUD and the potential user experience from a size and field-of-view perspective, It means much more information can be displayed (even if not all of it should be done simultaneously) in a manner that is comfortable for the user. The potential FoV available could be up to 40° wide and 20° high.

**DVN-I: What is your perspective on the future of HMI?**

**Ceres:** The automotive industry is clearly driven by the evolution of other consumer technology, and the 'smartphone-ization' of the vehicle has been obvious. However as the industry revolutionizes the complete HMI, the increasing use of large touchscreen displays came at the expense of safety (distraction!). However,

regulation is on the horizon, and several stakeholders recognize this (such as BMW and VW CEOs) and have acknowledged that it will require a better balance between touchscreens and control buttons.

For a long time, HUDs have been a dream for OEMs, but technical, design, and economic challenges hindered mass adoption. Ceres have helped to overcome these obstacles by combining holographic technology and proven design, mastering, and production methods. Now there is a good opportunity for HMI deployment in order to communicate information in and just below the normal line of sight of the driver. Doing this on an industrial scale and at the cost required is where Ceres technology is a best solution.

**DVN-I: How do you foresee transparent display market growth?**

**Ceres:** We expect our first application to be starting in production in or around 2026/2027, and growing to 3 million cars a year by 2032.

Today's HUD take rate is approximately 15 per cent. Feedback from our OEMs suggest they intend to use Ceres capability to enable it to become standard on any model as it completely reconfigures the HMI of the vehicle for significant user benefit.

China might probably be the first application deployment into production, as the market is pulling much stronger, for the sake of desiring new technology and product differentiation, but also because the development process is much faster there.


**DVN-I: What could be other applications of your technology?**

**Ceres:** Trucking and human operated industrial machinery is a big opportunity. Not only is the safety case strong, but our holographic technology is very suitable as well for near-vertical windscreen or side window surfaces. Several OEMs have already express interest for these kinds of applications.

**DVN-I: What else would you like us to know?**

**Ceres:** The technology is ready, the industrialized equipment we have here in Livingstone is able to support production for 250,000 vehicles a year, with expected more machines being built to accommodate higher volumes by 2026. What is needed now is for OEMs to accelerate the development of new HMI experiences with our technology, to shine in the vehicle.

# Interior News

## TouchNetix's New TactoSense Buttons

INTERIOR NEWS


TOUCHNETIX IMAGE

TouchNetix, a supplier based in Trondheim, Norway, has a new range of control buttons. They're called TactoSense, and they enable combinations of touch and force sensing, alongside haptic triggering, and LED feedback, facilitated by Axiom's single-chip technology. Using this solution, customers can integrate buttons, button bars, sliders, or joysticks within a variety of smart surfaces and materials.

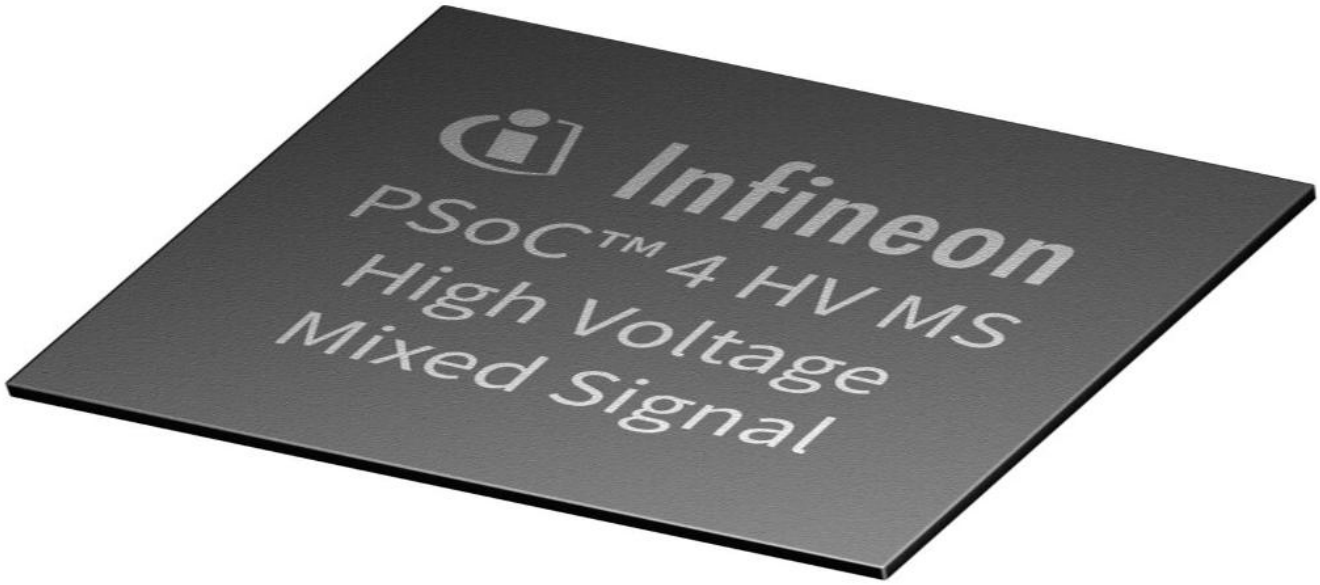
Facilitated by Axiom's patented force sensing technology, TactoSense supports up to 26 buttons concurrently and customers can tune specific buttons to be force and/or touch enabled, in addition to combinations of multi-touch, multi-force and hover detection. Axiom also enables touchless and 3D sensing above the surface.

TouchNetix Engineering Director Peter Sleeman says the new product range "offers the opportunity to integrate tactile buttons with a mechanical feel, all without complicated integration or prohibitive costs. This technology can be integrated within a variety of touch surface materials, including plastic, leatherette and even metal, making it an attractive solution for the automotive, industrial and consumer sectors".

TouchNetix manufactures chips and touch sensor modules for a world-wide customer base with offices in Norway, United Kingdom, Germany, the USA, Korea, and Taiwan. They are QMS certified to ISO 9001 with an IATF-16949 certified supply chain, and Axiom chip products are qualified according to AEC-Q100 and are ASIL B ready certified.

# Infineon Solutions for Touch-Enabled HMI

INTERIOR NEWS




INFINEON IMAGE

In response to the increasing importance of security and functional safety in the auto industry, Infineon Technologies has introduced the PSoC 4 HVMS family of automotive microcontrollers. They integrate high-voltage features, such as a 12V regulator and LIN/CXPI-transceiver, with advanced analog features like CapSense and inductive sensing.

The HVMS family is designed for touch-enabled automotive HMIs, featuring touch buttons, sliders and touchpads for controlling various functions like HVAC, interior lighting and power windows/sunroofs. It can also be used in steering wheels for touch sensing and hands-off detection.

The CapSense module supports proximity detection for occupant detection or foot kick control, and the microcontrollers can also be used in generic sensing applications such as liquid level sensing, and in simple actuators, such as PTC heaters and interior/exterior lighting.

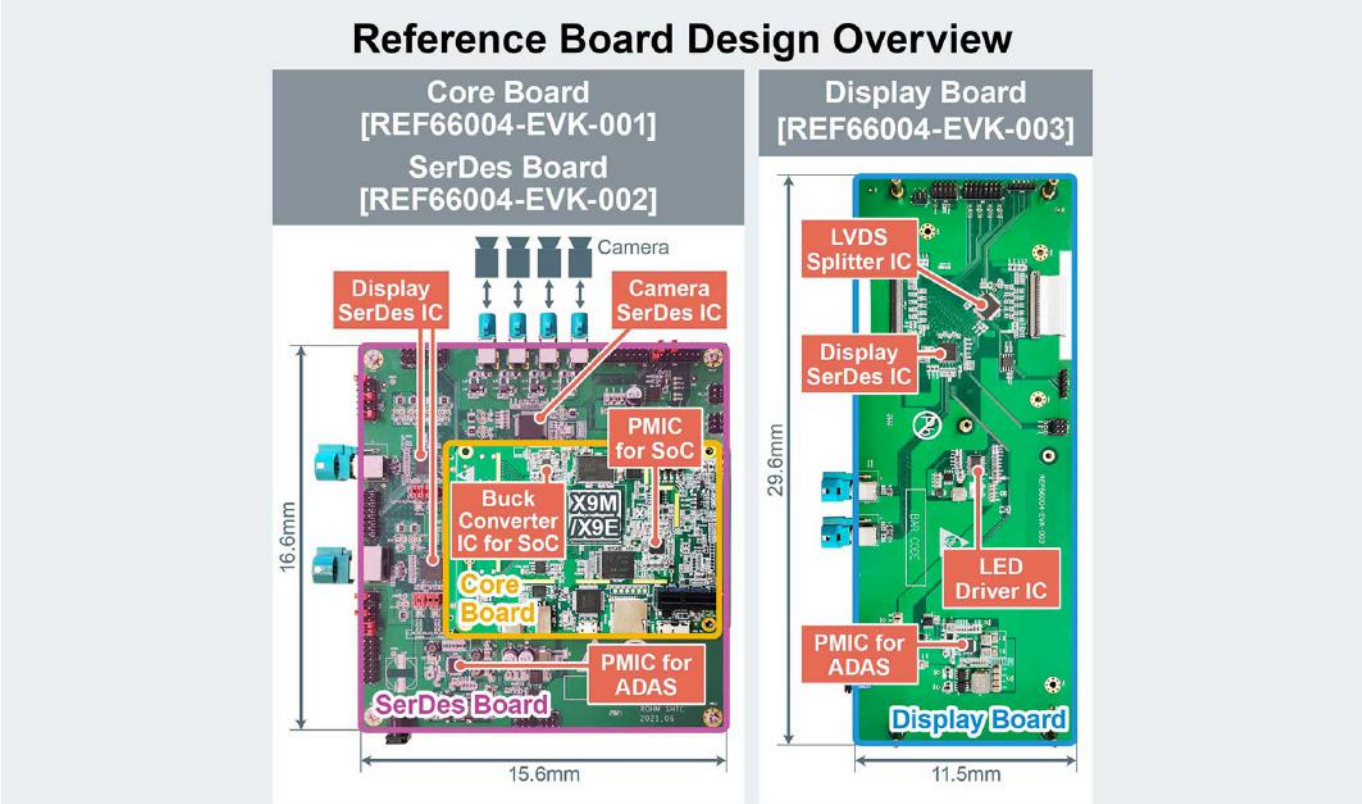
The company says the microcontrollers are AEC-Q100 qualified and offered in small footprint QFN packages with wettable flanks. They are designed for scalability and pin compatibility across devices, with ISO26262 ASIL-B compliance for safe operation at high temperatures.

Comprehensive software support is provided, including the Automotive Peripheral Driver Library (AutoPDL), Automotive Middleware Library for CapSense, and the Safety Library (SafeTlib) for Automotive PDL.

Samples of the PSoC 4 HVMS controllers are already available, and Infineon showcased them at Embedded World 2024 in Nuremberg, Germany this past April.

# Rohm, SemiDrive Reference Design for Smart Cockpits

INTERIOR NEWS




ROHM SEMICONDUCTOR IMAGE

Rohm, together with Chinese SoC manufacturer SemiDrive, have codeveloped a reference design for smart cockpits, which includes PMICs, SerDes ICs, LED driver ICs and other components from Rohm.

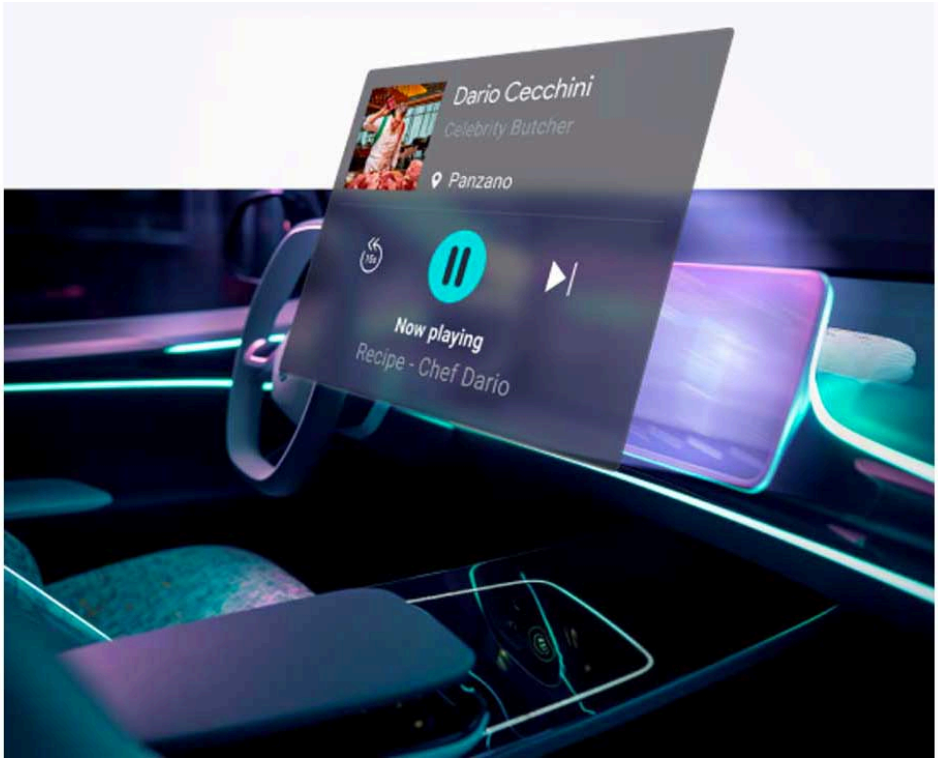
Rohm is a Japanese electronic parts manufacturer based in Kyoto. The company was originally called R.ohm, which was derived from R for resistors, the original product, plus ohm, the unit of measure for resistance. SemiDrive Technology, based in Nanjing, is a Chinese startup developing smart car microchips. The two companies have been cooperating since 2019

The new product comprises three boards: the CoreBoard, the SerDes Board and the Display Board. The new reference design combines SemiDrive's X9M and X9E SoCs for intelligent cockpits with ROHM PMICs for SoCs and ADAS, SerDes ICs (for display/camera), LVDS splitter IC and LED driver IC for vehicle displays.

The design offers a cockpit solution that can control up to three screen projections and four cameras. In addition, Rohm's new PMICs for SoC are said to enable arbitrary output voltage setting and sequence control via an internal memory (one-time-programmable memory), enabling flexible, high-efficiency power supplies tailored to the requirements of the circuit.

# New AI IVI from P3 + Mappo

INTERIOR NEWS




MAPPO IMAGE

P3 Digital Services, a Germany based in-vehicle infotainment (IVI) technology specialist, has collaborated with AI technology company Mappo to elevate the driving experience for users of Sparq OS IVI, with the Mappo app now pre-integrated into the Sparq OS platform.

Sparq OS, developed by P3, is a dynamic IVI solution based on the Android Automotive OS that uses an app store, intelligent navigation, digital voice assistant and entertainment features.

Israel-based Mappo leverages AI and location-based technologies to deliver a 'culture-oriented' travel experience within the car. Through natural language processing (NLP) technology, Mappo extracts relevant information from literature, historical references, films, and other sources, tailored to the user's current location or preferences.

P3 CTO and Managing Director Marius Mallat says, "Because both platforms have location-based technology at their foundation, Mappo is a natural fit and we're certain Sparq users will enjoy engaging with the Mappo culturally inspired app, whether their time in the car is brief or extended. Sparq's own Voice Personal Assistant powered by Hey Jane just got superpowers".

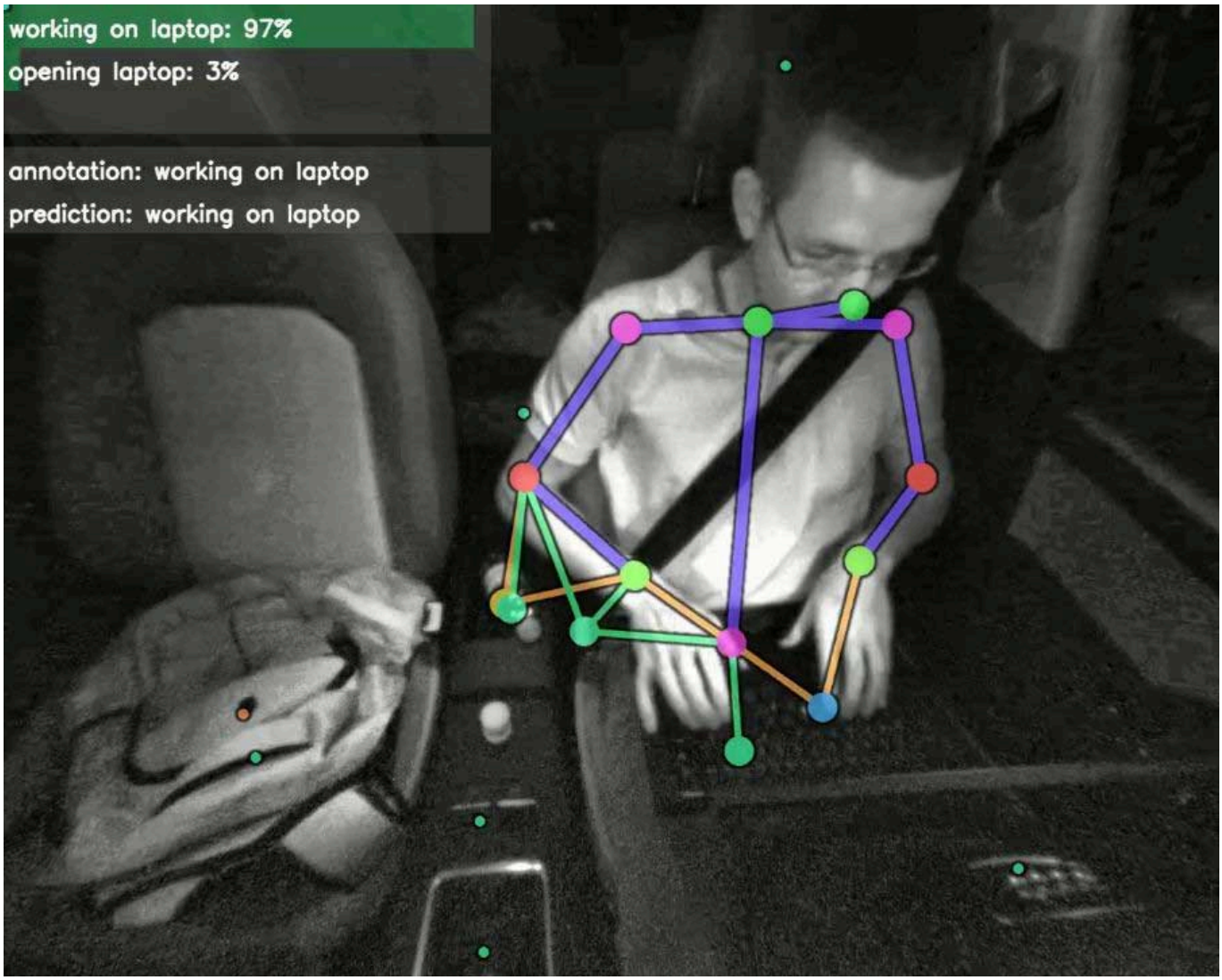
This integration provides Sparq users with effortless voice control, enabling them to discover new places, gain insights into familiar surroundings, or learn about notable landmarks simply by using voice commands, P3 says.

"We're really excited to now be part of the dynamic Sparq platform," said Deddi Zucker, Mappo founder and CEO. "We look forward to building on our partnership with P3, and engaging with both OEMs and their customers to elevate driving enjoyment, making every trip richer through learning about culture and history, meanwhile having fun.

Introduction video

# Fraunhofer IOSB's Advanced OMS

INTERIOR NEWS

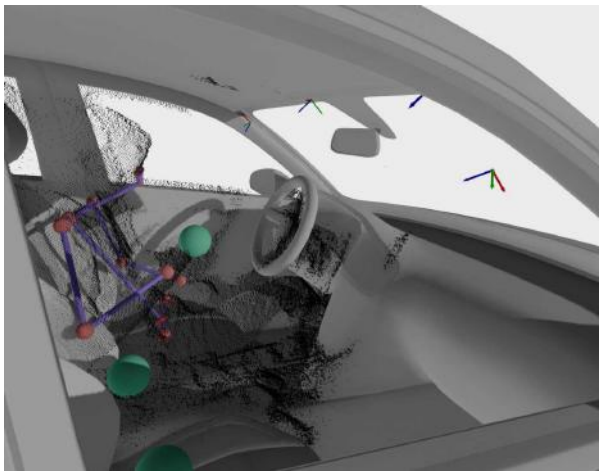



FRAUNHOFER IOSB IMAGES

Fraunhofer IOSB's Advanced Occupant Monitoring System goes significantly further than previous state-of-the-art systems and uses optical sensors in the vehicle interior, as they are becoming increasingly common in modern vehicles. The Advanced OMS detects the driver and all occupants equally. It recognizes the 3D body pose of all persons, analyzes their movement behavior, and classifies the activity of each individual person. This makes it possible not only to detect critical situations such as a driver falling asleep, but also to distinguish between different activities and the associated levels of distraction. This benefits safety systems and comfort functions in the vehicle interior in equal measure.

The basis of the system is the real-time detection of body pose in 3D. For all vehicle occupants captured by cameras, the body pose is recognized as a 3D skeletal model using machine learning techniques. The resulting image of the captured occupants includes the position of the eyes and head, neck, shoulders, elbows, wrists, torso, pelvis, and upper and lower legs, as soon as they are visible in the camera image. The recording does not require biometric data and is therefore particularly privacy-friendly.

The system can use individual 3D cameras or several 2D cameras, from whose perspectives the 3D joint points are reconstructed. The cameras can be mounted in any position if the view of the respective persons is sufficient.



The positions of the eyes, the elbows, and the wrists also emerge from the determined body pose skeleton. This makes it possible to interpret both the direction of the forearm and the pointing direction of the eye-hand extension as pointing gestures.

In more automated driving situation, the driver is given the freedom to pursue secondary activities. Partially-automated vehicles must take this fact into account when dealing with situations in which driving responsibility is to be handed back to the driver. The driver may be distracted, asleep or even have a medical emergency.

The system detects the activity of all occupants inside the vehicle. It is able to distinguish among up to 35 activities, including drinking, eating, sleeping, reading, making phone calls, and more.It thus provides important information on the driver's distracted state. In addition, the system also provides important information on the prevailing situation in the vehicle interior and the context of a person's actions.

Activity recognition forms the foundation for predicting the intention of the driver or vehicle occupants. Because the driver's activity recognition tells us what the driver is doing or with whom, the driver's next actions can be predicted or narrowed down.

# Asahi Kasei's TPE for Soft-Touch Surfaces

INTERIOR NEWS

ASAHI KASEI IMAGE

Asahi Kasei will present new high-performance materials for automotive applications at the German Rubber Conference DKT - the leading trade fair for the rubber and elastomer industry in Europe – from 1-4 July in Nuremberg.

Specifically, they will present an innovative approach with a tailor-designed styrene block copolymer (SEBS) grade for automotive interior surfaces, which require good haptics and soft touch. Conventional approaches use different materials and production technologies for skin, foam and core layers in automotive instrument panels, door panels, armrests, or center consoles. The new SEBS material is suitable for both skin and foam layers, which can be molded in one step by utilizing a core back injection molding process. The connection to the polypropylene (PP)-based core layer is possible in the same or separate injection molding step. The strong chemical bonding between all layers eliminates the need for additional adhesive layers. Asahi Kasei's new SEBS contributes to reducing the total number of materials, simplifying the manufacturing process, and improving the recyclability of interior components.

# Kia EV3's Living Room Interior

INTERIOR NEWS

KIA IMAGES

Kia's first compact SUV developed as an EV, the EV3, goes on the market this year. Its designers wanted to give the interior a kind of living room character. Kia offers a small sliding table, which can be pulled out from the center console and gives space for a laptop or a small picnic during a charging break. The lower area can store drinks, snacks, and even small backpacks, Ambient lighting and seats with reclining function are also available.

There's a 30” panoramic display array, which comprises three displays side by side: a 12.3” for instrument display, a 5.3” touchscreen for operating the climate control functions and a 12.3” screen for navigation and infotainment. The displays for the driver and the infotainment system can be personalized with various display themes via the Connect Store. There is also a 12.3” HUD.
Many of the EV3's functions, including drive mode, cruise control, entertainment, and navigation, can be accessed and controlled by the steering wheel buttons. A seamless row of buttons below the central screen allows intuitive operation of functions like mapping, media, and vehicle system configuration. A voice assistance will work with AI in the future.

The usual updates are available via OTA. Add-on apps for music and video streaming and games can also be purchased. With LG's premium streaming service, passengers can access streamable content or play arcade games in the car. A Harman/Kardon sound system is available.

The key is digital on request—which means the smartphone serves as the key. This makes it easy to share the vehicle with up to seven other people (as long as they have smartphones).

Recycled fabric is applied to the dashboard and door trims to create an intimate and homy ambience. PET, which is among the most easily recycled plastics, features in numerous areas of the interior, including the seats, headliner, door armrests, garnish, floor mats, and luggage board.

# The Design Lounge

## BMW Concept Skytop: Luxury & Craftsmanship

THE DESIGN LOUNGE

BMW IMAGES

The elegant BMW Concept Skytop design study was shown at the Concorso d'Eleganza Villa d'Este,the annual beauty contest for historic cars and motorcycles held on the shores of Lake Como, in northern Italy.

The interior and exterior of the concept car feature warm monochromatic colors, blending exclusive materials with old-time craftsmanship.

Adrian van Hooydonk, BMW Group's Head of Design, calls the car "a truly unique and exotic design, in the tradition of the Concorso d'Eleganza Villa d'Este…it offers a combination of driving dynamics and elegance at the highest level, comparable to its historic ancestors, like the BMW Z8 or BMW 503".

The leather-finished roll-over bar behind the BMW Concept Skytop's two seats is combined with side fins on the B-pillar and a fully retractable rear window. The two removable roof parts, also finished in leather, can be stored in a special compartment in the luggage space.

The color scheme ensures a smooth transition from interior to exterior, regardless of whether the roof is open or closed. The leather seats feature brogue-style accents. The reddish-brown tone of the surfaces creates a consistent color scheme that gives the whole interior a sense of luxury and roominess.

Crystals are artfully embedded in the cockpit, adding to the overall impression. The interior surfaces were crafted in the traditional saddlery of the BMW Group plant in Dingolfing.

# News Mobility

## Peugeot Tests Remote-Control Driving

NEWS MOBILITY

VAY IMAGE

Peugeot is showing an E-308 with technology for remotely-controlled driving. This is intended to create new opportunities for delivery services, car sharing, car rental and light commercial vehicles.

Peugeot and Vay, a German startup, have equipped a Peugeot E-308 with the startup's teledriving technology. Both companies want to investigate how the technology can be used in practice for both passenger vehicles and light commercial vehicles. One focus will be on B2B applications and on use cases for last-mile delivery.

Vay has developed their remote-controlled driving technology for public road traffic. The company launched a commercial car-sharing service in Las Vegas a few months ago. According to Vay, teledriving could have a significant impact on short-distance scenarios, such as the delivery of goods, managing the flow of vehicles in logistics centers, and valet parking at car-sharing or rental companies.

Vay's Chief Business Oficer Justin Spratt says, "We're excited to work with Peugeot to bring teledriving to several vehicle categories; from the delivery sector, driving efficiency for logistics companies, to vehicle valet services for rental and car share companies. We are convinced that teledriving has many benefits that will drive up driver experience, efficiency and safety".

Peugeot showcased the technology at Vivatech this past May, in Paris.

# Zoox to Grow US AV Fleets; NHTSA AV Probes Ongoing

NEWS MOBILITY


ZOOX IMAGE

In California and Nevada, Amazon's Zoox has been testing their bespoke autonomous vehicles built without steering wheels or pedals and have room for four passengers. Now Zoox plans to start testing autonomous vehicles in Austin, Texas, and Miami, Florida—their first trial sites outside the western US. This time, it will be a test fleet of retrofitted Toyota Highlanders with human safety drivers in small areas near the business and entertainment districts of the two cities.

The expansion announcement comes amidst an investigation by NHTSA into 500 Zoox vehicles after two crashes.

Zoox said they will not offer public rides in Austin and Miami yet, but are exploring several cities for commercial offerings after their initial launch in its target markets of Las Vegas and San Francisco.

Along with Zoox, other self-driving robotaxi companies like General Motors' Cruise and Google's Waymo have been embroiled in NHTSA investigations involving unsafe or injurious vehicle behavior. The probes involve five automakers, who have been found to have submitted flawed or manipulated data when applying to safety-certify some vehicle models. Cruise said they have resumed operations in Dallas, Texas, with a small fleet of vehicles with human safety drivers after the company  paused operations after one of their vehicles hit and dragged a pedestrian in San Francisco last October.

# General News

## China NEV Quality Worsening: JD Power

GENERAL NEWS


The overall average quality of new energy vehicles (NEVs) this year is 210 problems per 100 vehicles (PP100), a significant increase of 37 over the 2023 level—that's the conclusion of the J.D. Power 2024 China New Energy Vehicle Initial Quality Study SM (NEV-IQS), which homed in on the problems as primarily stemming from bad design, rather than faulty build or component failure.

The study, first published in 2019, measures new-vehicle quality by examining problems experienced by NEV owners in China within the first two to six months of ownership.

Elvis Yang, J.D. Power China's General Manager of Auto Product Practice, says, "The competition in the NEV market is intensifying, with automakers constantly launching new models to capture market share. This has led to significant challenges in quality management as development cycles shorten. This year's study shows that **design-related problems significantly outnumber defects**. Automakers must prioritize user experience and perceived quality during R&D and focus on thoroughly validating high-tech features to enhance the user experience".

Problems with driving assistance and infotainment systems increase significantly: In 2024, the quality problems for driving assistance and infotainment systems increased by 7.2 and 6.9 PP100, respectively, and are the two largest increases among 10 categories. Driving assistance problems mainly affect reversing cameras—poor image clarity, dirty lenses, and loud radar alerts. Infotainment problems include **inaccurate voice recognition, unresponsive touchscreens, and inaccurate navigation**.
**Unpleasant interior smell** (7.2 PP100) and **road noise** (5.7 PP100) are the top two quality problems—and have been for six consecutive years. However, compared with 2023, the number of problems in these two areas have decreased 2.2 and 1.8 PP100, respectively.

The China NEV Initial Quality Study (NEV-IQS) measures new-vehicle quality by examining problems experienced by NEV owners in two segments: design-related problems and defects or malfunctions. Its questions ask about 236 problem symptoms across 10 categories: features/controls/displays; exterior; interior; infotainment system; seats; driving experience; driving assistance; powertrain; battery/ charging; and climate.
The study this year is based on responses from 9,791 vehicle owners who purchased their vehicle between July 2023 and January 2024. The study includes 105 models from 48 different brands, among which 74 models have sufficient samples. The study was fielded from December 2023 through March 2024, in 81 cities across China.

# Great Wall Closes European HQ

GENERAL NEWS

ORA 03 (GREAT WALL IMAGE)

Chinese automaker Great Wall Motor (GWM) will close their European headquarters in Munich at the end of August. All 100 employees working there will lose their jobs. That's according to Steffen Cost, Chief Commercial Officer at Great Wall.

Cost emphasized that the measure does not signify a withdrawal from Europe. Rather, the contact persons for the European market will be in China. However, he said, there will be no further expansion into new European markets: "These are difficult times on the European car market. There is little demand for electric cars, and there is also the risk of punitive tariffs on Chinese e-vehicles".

The European Commission is currently investigating whether China is distorting the market for electric cars through state subsidies. If the EU finds that to be the case, Chinese electric cars could be subject to levies of 25 to 40 per cent, reportedly.

To get around this, some Chinese manufacturers have already announced production in Europe. The import of combustion engines should also continue to be possible without punitive tariffs as things stand. Both are said to be under discussion at Great Wall.