Thu, 26 January 2023
Weekly Newsletter

DVN-I
Automotive Interior

NEWSLETTER #145

Editorial

'Smart' Surfaces, Embedded Electronics

PANASONIC DEMONSTRATOR 2017 (PANASONIC IMAGE)

CES is a bottomless source of innovation; its flows keep irrigating the DVN Interior Newsletter. And this week's in-depth article focuses on 'smar't surfaces which keep expanding to cover more and more of the real estate inside vehicles. It's a perfect instance of the essence of CES—a crossroads between consumer electronics and the automotive realm, between what we're all accustomed to on our smartphone, and what users are said to want in a vehicle as well, for a continuous experience.

In this week's Coffee Corner, there's an opinion on how the Peugeot Inception concept is proposing a tech composition for future of car interiors to the benefit of all senses, shifting from surfaces that embed intelligence to intelligent surfaces.

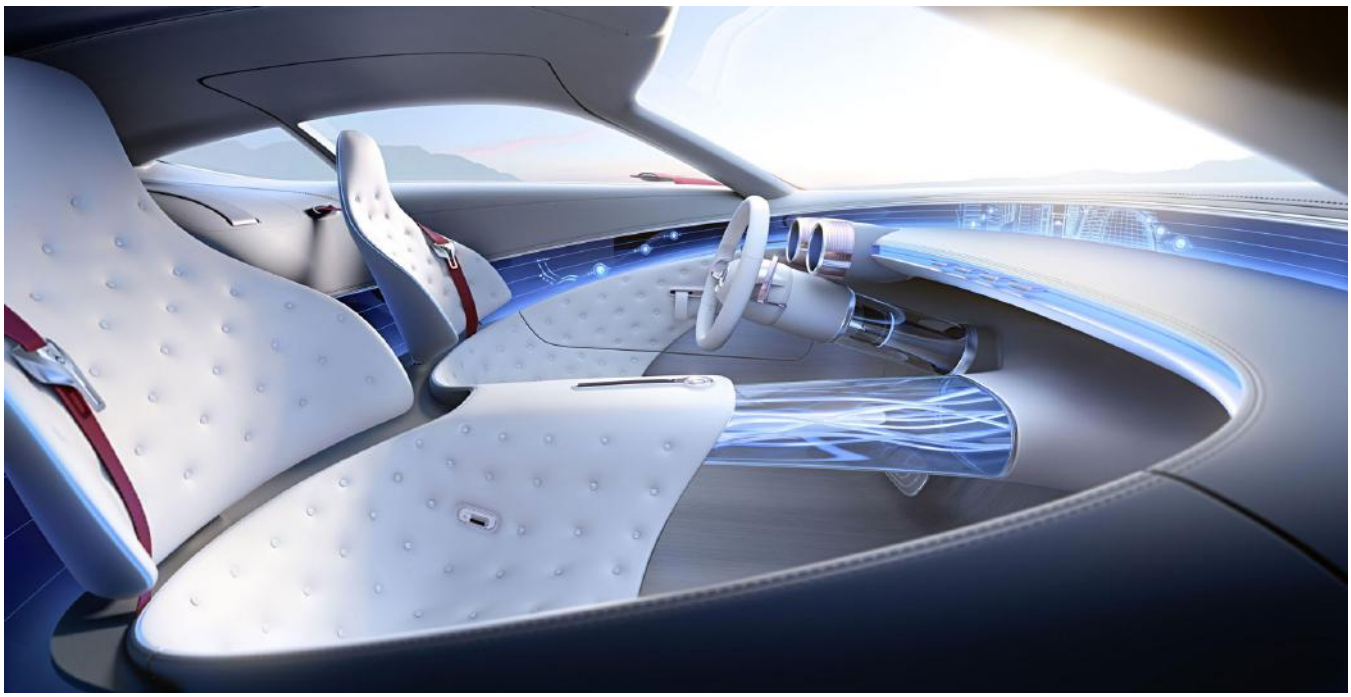
'Smart' surfaces will be one focus of the upcoming DVN Interior Workshop on 25-26 April at the Pullman Hotel in Köln, Germany. The event, with the rubric **Human Centered Interior Technology**, will bring together around 200 participants from all over the world: managers; experts, and decisionmakers involved in automotive interiors. Exhibition booths and lecture slot priorities are given to DVN Interior members, so please **confirm your participation** before 16 February.

Happy New Year of the Rabbit to our Chinese members!

Philippe Aumont
General Editor, DVN-Interior

In Depth Interior Technology

'Smart' Surfaces Expand in Vehicle Interiors



MERCEDES-MAYBACH VISION EQS CONCEPT CAR 2016 – MERCEDES IMAGE

The CASE automotive megatrends—connected; autonomous; shared, and electric—have an enormous influence on the design of the future car. MaaS (mobility as a service) is also playing an increasingly important role and changing the way we look at the vehicle; its functions, and requirements.

This new relationship with the vehicle is generating new use case scenarios, such as entertainment or mobile office during the daily commute to work or to a meeting, a big shopping trip or group excursions and goods transport instead of unproductive waiting times, which today account for about 95 per cent of the vehicle life. In addition, the industry's requirements for sustainability and CO_2 reductions are increasing, thereby massively influencing on future vehicle design.

As presented almost every week here in DVN-I, new connectivity and new user scenarios in more automated vehicles, and sustainability overall, are greatly influencing what drivers and occupants are and will be doing in a vehicle. Therefore, the interior cabin environment is being reimagined, as is the way occupants interact within this environment.

SONY IMAGE

CES 2023, reported at length in our two previous editions, confirmed completely these trends, and the rapid entry of gaming into the vehicle not being the least. However, this revolution is multi-dimensional and multicriterial, so let's take a look at 'smart' surfaces: those which can interact with a vehicle occupant, and which are located within appropriately ergonomic reach of such an occupant. It means also integration of electronics and sensors into these surfaces, and the surface becomes 'smart' as it get functionalized with controls and displays.

Continental's Invisible Control Panel

CONTINENTAL IMAGE

At CES, Continental had a press conference to announce (among other things) a partnership with Silicon Valley-based Ambarella to jointly develop scalable, end-to-end software and hardware systems based on artificial intelligence for assisted and automated driving, on the way to autonomous mobility. Continental also displayed their Curved Ultrawide Display concept with an invisible control panel. The immersive pillar-to-pillar display is illuminated by more than 3,000 LEDs, producing excellent high-contrast picture quality.

The screen is operated by an invisible control panel which only appears when required—call it 'shy tech' or more generally a 'smart surface'.

Preh's Haptic controls on touch screens

PREH IMAGE

To reduce driver distraction, Preh combines the flexibility of touchscreens with haptic control elements. A first solution went into series production in 2020 as a combination of a rotary knob with a 15.5" portrait touch screen. Further solutions from Preh, in early developmental stages, are haptical marks and 3rd overlays on the screen surface to reduce eyes-off-road time. A big leap into the future is to use a rotary dial that can be attached to and removed from the touch screen.

So users familiar with just displays can be supported as well as the ones that will use a totally new HMI world by moving the knob on the screen to control functions. It could be extended to any surface, as long as it is easily reachable for the driver.

Canatu

CANATU IMAGE

Finland-based Canatu's advanced CNT (carbon nanotube) technology was on exhibit at CES in the form of 3D touch technologies and ADAS heaters. By providing these transparent, 3D-formable touch sensors to the automotive industry, Canatu unlocks design freedom and new, intuitive human-machine interfaces.

There was a multi-award winning Origo steering wheel demonstrator featuring Canatu 3D touch sensors. This demonstrator highlighted how virtually any surface in the car can be made 'smart' and functional to improve safety by minimizing distracted driving.

Grupo Antolin

GRUPO ANTOLIN IMAGE

Some years back, Grupo Antolin's strategic partnership with Walter Pack yielded decorative inserts and smart surfaces based on films made from technologies such as IMF or IMD among others. 'Smart' surfaces are a combination of a decorative surface material and additional functionalities such as lighting (ambient or functional); touch controls, or even haptic feedback. To guarantee success, the development of these surfaces is done at the early stages of the conception of a new car model in cooperation with the design studios and engineering departments of the automakers.

All the surfaces inside a vehicle can become aesthetically pleasing, multifunctional surfaces. Ordinary switches are progressively being replaced by touch surface alternatives; displays are seamlessly integrated, and plastic surfaces are covered up with films or natural materials to make the interior more comfortable.

Tactotek

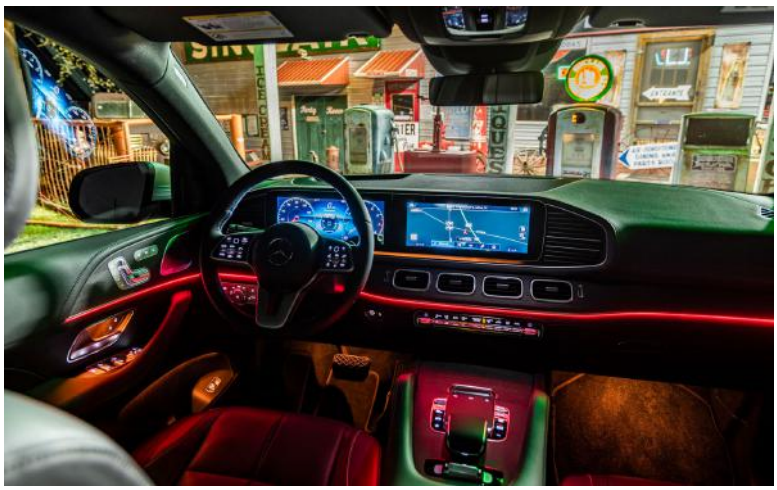
TACTOTEK IMAGE

Tactotek's IMSE technology transform a plastic surface into a 'smart' surface, **as we've previously reported**. A year ago, Tactotek in partnership with Covestro presented a 'smart' surface material in the BatRay overhead control console. This functional and decorative surface included in-mold illumination and touch controls. It is eco-friendly because it reduces the number of parts to fulfill a use case; reduces plastics use by up to 70 per cent, and cuts CO_2 emissions by up to 35 per cent relative to conventional electronics. Electronics for wiring and touch controls are printed using clean additive processes, and electronic components are surface mounted on polycarbonate film which, along with a decorative film, is inserted into an injection mold for encapsulation in polycarbonate resin. The result is a unitary, seamless electronic structure.

Byton M-Byte

The dashboard display in Byton's M-Byte electric SUV is 48" and curved, comprising three separate content areas. To control the display, the driver can use a 'smart' surface: a 7" driver tablet that sits at the center of the steering wheel, or an 8" touchpad in the center console. The first concept car was presented at CES 2018.

Mercedes MBUX



MERCEDES IMAGE

Unlike the various touch screens in a Byton, Mercedes is exploring how to remove touch altogether with the Mercedes-Benz User Experience (MBUX) Interior Assistant. As a hand approaches the touchscreen in the

dashboard or the touchpad on the center console, the interior assistant recognizes in-air hand motions and controls the vehicle functions displayed on the car's in-dash display screen, according to the active menu.

Mercedes interior assistant can also distinguish between the driver's hand and the front passenger's hand to identify who needs localized functions, such as a seat's massage function.

YANFENG IMAGE

That is just a small selection of 'smart' surfaces. DVN Interior also published recently technology from Grupo Antolin and 3D smart-surface technology specialists Uniphy, who have agreed to collaborate on in-car user-interfaces; PolyIC's PolyTC touch sensors for 'smart' HMI surfaces and integration into textile (previous coverage **here**), and also recall Yanfeng's **lecture** at last year's DVN-I Workshop.

Ultrasense

ULTRASENSE IMAGE

Consider also UltraSense Systems' new UltraStudio 2.0: an HMI/UX design and human factors evaluation tool to help facilitate testing and comparing various settings of touch to feedback, including illumination, audio and haptics. It helps accelerate the product development phase of the HMI end user experience.

UltraSense Systems announced last month what they cal In-Plane automotive sensing technology, the ability to enable multi-mode sensing and HMI control in the plane of the 'smart' surface (or A-surface), drastically reducing the size, weight, enabling modern designs and offering highly configurable optionality, that reduces part numbers and build complexity. This translates to advantages in sustainability and recyclability, increases driving range, and enables modern designs and new user experiences that were not possible before such as supporting controls for retractable steering wheels that require elegant slim form factors.

In-Plane sensing is a major step towards the ability to deliver a full HMI experience by enabling the thinnest possible space. This is more than a capacitive ITO layer, but as defined by offering sensor fusion and enabling multimode sensing; processing, and algorithms, and feedback control: illumination, audio, haptics, and secure connectivity. It is a recipe for transformational changes in reducing the size of existing automotive module depth. Combined with the TouchPoint family of HMI controllers, InPlane sensing enables designs that support all types of 'smart' surface HMI interactions through the broadest set of materials, beyond just capacitive plastic and glass. 'Smart' surfaces can now operate through natural materials such as wood and leather to metal and other soft surfaces.

Conclusion

'Smart' surfaces integrate embedded electronics; sensors; haptics, and lighting, thoughtfully located within the ergonomic and mental reach of the vehicle's occupants.

Interior News

Aehra: Cabin Space, Multi Position Cinema Screen

INTERIOR NEWS

AEHRA IMAGES

Aehra, a (so far) self-funded new ultrapremium EV brand headquartered in Milan, Italy, has released images and details of the interior of their first SUV. With an exceptional three-meter wheelbase, the SUV provides class-leading occupant space and is claimed to set new standards for comfort, technology, materials, and usability. Aehra's decision to leverage the inherent advantages of an EV platform has resulted in an avantgarde exterior design and a revolutionary interior concept. The vehicle's exceptionally short overhangs; long wheelbase, and completely flat floor have enabled Aehra's designers to create a unique solution that transforms the interior environment for drivers and passengers alike.

One of the most innovative features is the full-dashboard-width HMI screen, which delivers a true step-change in entertainment and in-vehicle working.

When the SUV is in drive mode, the screen sits in a lower position to display all the information the driver requires, such as speed, range, heating and ventilation settings and navigational instructions. The two outer areas of the screen serve as virtual exterior mirrors, relaying high-definition images from two front exterior side cameras. When the vehicle is parked, occupants can choose to extend the screen upwards, instantly transforming the vehicle into a home theater or an office environment.

A secondary, smaller oblong-shaped touchscreen is mounted in the center of the hand-stitched leather dashboard. Located between the driver and the passenger, it enables both front-seat occupants to control most of the vehicle's functions such as navigation, heating and ventilation and entertainment.

Along with evoking a race-car-like ambience, the oblong steering wheel and the seats' low-weight, high-strength construction and optimum comfort levels (made out of aluminum, recyclable carbon fiber composite and leather), also pay homage to the Aehra team's passion for the aeronautics industry.

Kyocera's New Mini MicroLEDs

INTERIOR NEWS

KYOCERA IMAGE

Kyocera has introduced a new thin-film process technology for manufacturing unique silicon substrates for Gallium Nitride (GaN)-based micro light sources. This also includes short-cavity lasers and microLEDs. Micro light sources offer performance advantages such as higher resolution; smaller size, and lighter weight. In the future, they can be used in brighter or transparent displays with high resolution for autonomous driving. Other potential applications are in augmented and virtual reality. The new process is expected to avoid challenges in the manufacturing of micro light sources used so far, such as difficult peeling of the luminescent layer, a high defect rate, and high costs.

Kyocera's new process technology was developed at the company's own Research Institute for Advanced Materials and Devices in Kyoto, Japan. First, a GaN layer is grown on a silicon substrate. The GaN layer is then masked with a non-growing material that has an opening. Then, when a GaN layer is formed on the Si substrate, the GaN cores grow beyond the opening in the mask. While the core of the GaN layer has numerous defects in the initial stage of growth, high-quality GaN layers with low defect density can be produced due to the lateral growth. Components can then be successfully fabricated from this low-defect region of the GaN layer. The new process should enable the reliable separation of the GaN layers from the relatively inexpensive Si substrate and significantly reduce production costs.

Carbon Fibers Can Be Recycled, Asahi Says

INTERIOR NEWS

ASAHI IMAGE

TheCFRP (Carbon Fiber Reinforced Polymer)—the long name for what most of us call carbon fiber—makes vehicles lighter, safer, and more efficient. These laminates are very sturdy because a lot of pure carbon threads are woven into them. The polymer is additional reinforced by epoxy resin or plastic. As CF is deeply imbued with resin, materials separation has always been considered as an issue preventing practical recycling.

Presently, only high-performance race cars are made of carbon fiber laminates as they rely on acceleration and faster speed. Some vehicles that have their whole bodies made of CFRP are the McLaren 570S, Alfa Romeo 4C, Porsche 918, and Ford GT.

Diversified Japanese multinational company Asahi Kasei—they have activities in materials; homes, and healthcare—has developed, in cooperation with the National Institute of Technology, Kitakyushu College and Tokyo University of Science, a new technology for recycling carbon fiber plastic compounds. This recycling method allows carbon fibers to be extracted from CFRP or carbon fiber reinforced thermoplastics (CFRTP) used in automobiles. This results in high-quality, inexpensive continuous carbon fiber that can be recycled perpetually, contributing to circular economy. Unlike carbon fiber that is chopped up during the recycling process, Asahi Kasei's method allows carbon fiber to be extracted from a plastic compound seamlessly, resulting in continuous strands of carbon fiber that can be reapplied in the same manner while retaining properties identical to the original substance.

The new process is based on an electrolyzed sulfuric acid solution method that allows the carbon fiber to retain its original strength and continuous nature while fully decomposing the resin the carbon fiber is embedded in. This allows for its continued use in high-performance applications and presents an inexpensive, circular solution to the end-of-life dilemma of carbon fiber plastic compounds.

In addition, Asahi Kasei is developing a carbon fiber reinforced thermoplastic unidirectional tape (CFRTP-UD tape) that uses both recycled continuous carbon fiber and the company's Leona™ polyamide resin. Boasting a higher strength than metal, this CFRTP-UD tape can be applied to automobile frames and bodies, further enabling the recycling of end-of-vehicle-life parts into different, new automobile parts. Moving forward, Asahi Kasei will perform demonstrations and develop the business, aiming for practical application around 2030.

CFRP in car interior could be used for structural parts, such as seat frame or cockpit cross-car beams. And, as designers are becoming more and more impressed by the appearance of carbon laminates, this leads to using this material for some design and decoration applications, such as center console parts, decoration strips or door handles.

Texas Instruments' Next HMI Processor Family

INTERIOR NEWS

TEXAS INSTRUMENTS IMAGE

In the past, an HMI consisted of a physical control panel with pushbuttons; switches, and indicator lights that enabled users to communicate with a machine. As the technology progressed, it became possible for users to monitor processes, see status information displays and send commands. Now, HMI applications are everywhere, including smartphone apps used to control televisions, voice commands or gesture in a vehicle, patient monitoring in hospitals or touchscreen control panels in a factory.

The next generation of HMI will take applications beyond just human machine interfaces to methods of providing human machine interaction where machines can act intelligently and communicate with humans. Moving into a new world of human-machine interaction will require interactive applications with a new set of challenges for the processors that make HMI possible.

HMI designs will rely on edge artificial intelligence to enable new functions. For example, machine vision can enable controlled access to a machine through facial recognition or enable touchless operation with gesture recognition.

Designed for low power with many industrial peripherals, the first devices in TI's Sitara™ AM62 processor family, the AM625 and AM623 processors, bring power-efficient edge AI processing to dual-display and small-form applications with considerations for the next generation of HMI.

Gentex: DMS and Dimmable See-Through Visor

INTERIOR NEWS

GENTEX IMAGES

Gentex was at CES to showcase their product portfolio of vision, dimmable glass, sensing, and connected-car technologies that optimize driver vision while enhancing driving safety and comfort.

The Gentex booth featured a vehicle demonstrator with a driver and in-cabin monitoring. It provided an immersive experience that allowed visitors to see what the system's mirror- and overhead-integrated camera saw, understand the system's decision-making processes, and learn about corresponding feature sets.

Gentex's driver monitoring system tracks driver head pose, eye gaze, and other metrics to determine distraction, drowsiness, sudden sickness, and return of manual control in semi-autonomous vehicles. The system can be easily expanded to include 2D and 3D cabin monitoring for detecting passengers, behavior, objects, and even presence of life. Additionally, machine olfaction sensors provide a digital sense of smell for detecting airborne chemicals and particulates, helping keep passengers safe.

Gentex also supplies dimmable devices, shipping over 40 million units annually. The company's current product portfolio consists of glare-eliminating interior and exterior rearview mirrors, and electronically dimmable windows for the aerospace industry.

They also highlighted small-scale dimmable for visor and devices that darken to improve contrast and legibility for transparent displays, conceal sensors, and dynamically adjust camera exposure.

New to the product lineup are large-area dimmable devices, including sunroofs that darken on demand or in conjunction with system intelligence, and sun visors that fold down like a traditional visor but include a clear, dimmable panel that can darken on demand or in conjunction with sunload sensors.

2023 Mercedes-AMG S-Class: Luxury and Comfort

INTERIOR NEWS

MERCEDES-BENZ IMAGE

The latest Mercedes AMG S 63 E Performance delivers a range of AMG-specific luxury interior details such as multi-contour front seats with specialist upholstery and stitching. A range of distinctive colors and Nappa leather upholsteries can also be selected with embossed AMG emblems on the headrests.

AMG-specific trim elements include the AMG Performance steering wheel with a twin-spoke design and seamlessly integrated gearshift paddles. The AMG Drive Unit steering wheel buttons enable driving functions and driving modes to be controlled without the driver's hands needing to leave the steering wheel.

The MBUX infotainment system features an array of AMG- and hybrid-specific displays and functions, a multimedia central display and a head-up display.

The instrument cluster can be customized with different display styles and interchangeable main views to meet the driver's personal preference. This includes the AMG-specific Supersport style, which delivers an array of content through a vertical menu layout, such as hybrid-specific temperatures and set-up menus for the suspension and transmission.

The vehicle's head-up display also provides AMG's Race and Supersport displays, which are accessible through the main menu in the instrument cluster. Furthermore, high-quality graphics in the multimedia display show the power flow of the car's entire drive system, including the speed, output, torque and temperature of the electric motor, and battery temperature.

For sound, Dolby Atmos sound has the ability to position individual instruments or voices all around the cabin space. With conventional stereo systems feeding two channels to the speakers, Dolby Atmos can deliver a 360°, encapsulating audio experience.

The Design Lounge

Sweet Smelling Driving

THE DESIGN LOUNGE

NEW INTERIORS OFFER NEW CHALLENGES FOR VOCS (HYUNDAI FE FUEL CELL CONCEPT, 2017)

That new-car smell: some like it, some hate it, and some won't have any of it. Americans, Europeans, and the Chinese have opposite likes and dislikes, and four critical trends in the global automotive industry have emerged that are taking on the challenge of Volatile Organic Compounds (VOCs). From carpets, interior trim, leather, and fabric reducing the new car interior smell have become more challenging and critical as interiors become more sophisticated interior spaces.

VOCs have been an issue since automotive interiors is using plastic and the space sealed and enclosed. Remember wiping your front windscreen regularly to get the fog off it so you can have a better view? The materials used back then, especially the vinyl seats and other areas in the interior, puffed out VOCs and deposited them on our glass surfaces (…and in our lungs…).

In 2023 there are new concerns, uses, and development, and most of all, awareness to address the issue. Nearly all consumers globally experience some level of new-car smell in their vehicles. Although significantly reduced, it's still there. Some say that the new car smell is pleasant, but others report it makes them nauseous and causes eye irritation. In a time when gluten-free options, peanut allergies, and global awareness of sensitivities are constant in our news, interior smells and irritations are the culprit of VOCs from materials.

In contrast, most Americans love the new car smell (NCS). Americans associate the NCS with a premium, adding to their excitement as getting something new. In Europe, 50 to 55 per cent of people surveyed would pay extra for premium car interiors—carpet, trim, leather, and other material—that eliminate the smell and captures VOCs and other new pollutants that may enter the car's interiors. Europeans prefer no smell and a clean, fresh interior.

In China, a recent study revealed a new car smell signaled to consumers poor interior cabin air quality resulting from lower-grade materials being used for production. In a country where cities are loaded with smelly, bad air, the interior needs to be a neutral haven offering a clean, fresh environment and one that can maintain that over the car's life span.

The problem of new car smell is a global one; 91 per cent of consumers in the USA, UK, France, Germany, Japan, and China say that smelling material outgassing and environmental smells lingering inside the cabin when driving is not desirable, and in some instances, makes people sick or makes their moods sink.

New and expanding uses of vehicles

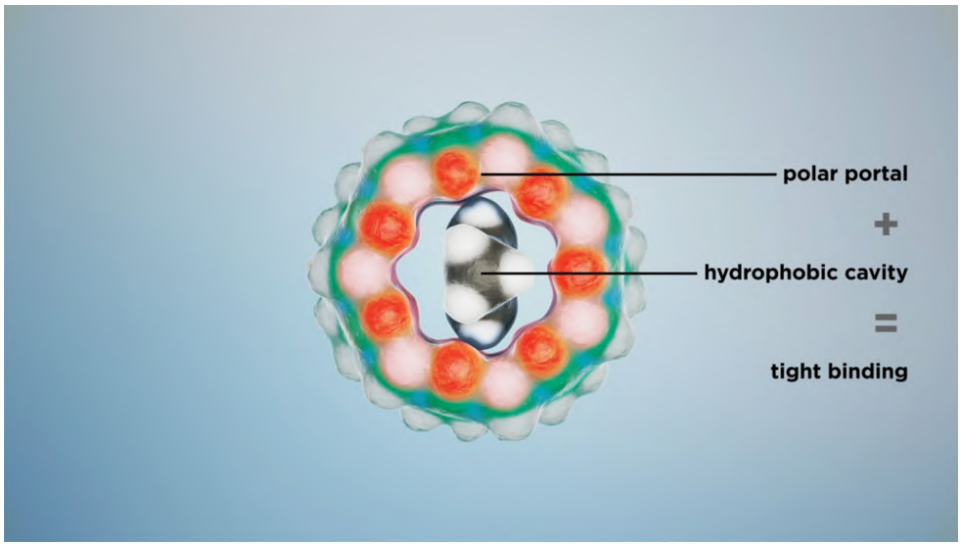
Home comforts rank high on the list, with consumers increasing expectations for comfort, functionality, and a pleasant-smelling environment. In addition, consumers want interiors to absorb and eliminate human/food odors, especially as their car ages. Finally, as more people in large cities take up car sharing, foul smells and hygienic surfaces being antimicrobial are becoming more critical, and consumers want them.

VOC studies and regulations are tightening on a global scale. In addition, outgassing and new car odor drive automotive manufacturers to prioritize interior VOC emissions and cabin freshness. Sustainability is essential too. The increasing use of recycled and bio-based materials can have foul smells that need to be eliminated. Some interior trim materials in new cars can emit high levels of VOCs. One study stated VOC levels in some vehicles can reach over 5,000 mg/m^3. That's the smell car companies are trying to deal with.

Making the grade for better interiors

Many Companies are developing technology and material for IAQ (interior air quality, as we've **previously covered in depth**. One new material, called AqFresh, is an additive developed by Cambridge, England-based chemical company Aqdot. It is an additive technology, a supra-molecular powder incorporated into nonwoven textiles and plastics commonly found in automotive interior parts. The new patented technology uses cucurbiturils—molecules with a particular hollow hydrophobic cavity and polar portals—enabling them to tightly bind a broad spectrum of unwanted stinky molecules like those to outgas from materials.

This unique technology has been applied to textile and nonwoven materials through dry impregnation, spraying, and padding during the finishing process. **Find our detailed coverage here**.



AQDOT IMAGE

As we advance, interiors will become neutral and even be able to absorb noxious smells presented to them: so much advancement and pleasant aromas for everyone.

'Intelligent' surfaces

THE DESIGN LOUNGE

COFFEE CORNER
DVN
Interior

PEUGEOT INCEPTION AT CES 2023 (DVN IMAGE)

When a concept car is presented at the greatest tech show in the world, the challenge is clear. Peugeot's Inception was presented at CES this year to face up to the latest and greatest tech trends. It is intriguing to think of it this way: a myriad of technologies displayed among countless pavilions, occupying tens of thousands of square meters. Peugeot took the challenge to put many of them all in one product, in the attempt to open new perspectives and pave the way for a radical transformation of the automotive skill writ large. Besides reinventing the spatial experience of driving, the Inception illustrates a new approach to design and to the complex process of conceiving and developing. Over the years a progression of cutting-edge technology has been used for surfacing. Presentations like Peugeot's make the case that from now on, design will use surfaces as the technology itself.

While new electric native platforms introduce AI-powered technology modules, the Inception's passengers are surrounded by 7.25 m^2 of 'smart' glazing. This glass surface reflects the exterior body color but equally diffuses bursts of light, constantly modifying the reflections and tints in the interior. The treatment of multichroic glass—like astronaut visors—solves the thermal and anti-UV problem while creating a unique liaison between the exterior and the interior. All front view body surfaces converge and the entire grid merges the signature part into one object that also embeds sensors. Four optical modules are housed under the glass mask, and the whole surface is treated to a mirror effect. Door skin surfaces, through AI, can recognize driver and passengers and attain comfort settings—seat posture, temperature, driving mode and multimedia preferences—desired by each occupant. Once inside, cabin surfaces incorporate sound bars, each comprising several 100-mm coaxial loudspeakers, as part of a premium audio system defining sound and space envelopes within the compartment. Multichroic glass, digital inkjet technology, "Fusion Mask", communicating doorskin, and the 'Hypersquare' control combined with a disappearing dashboard called the 'Halo Cluster', immersive seats and 'forged textiles' are just some of the new terms the Inception introduced along with its technology.

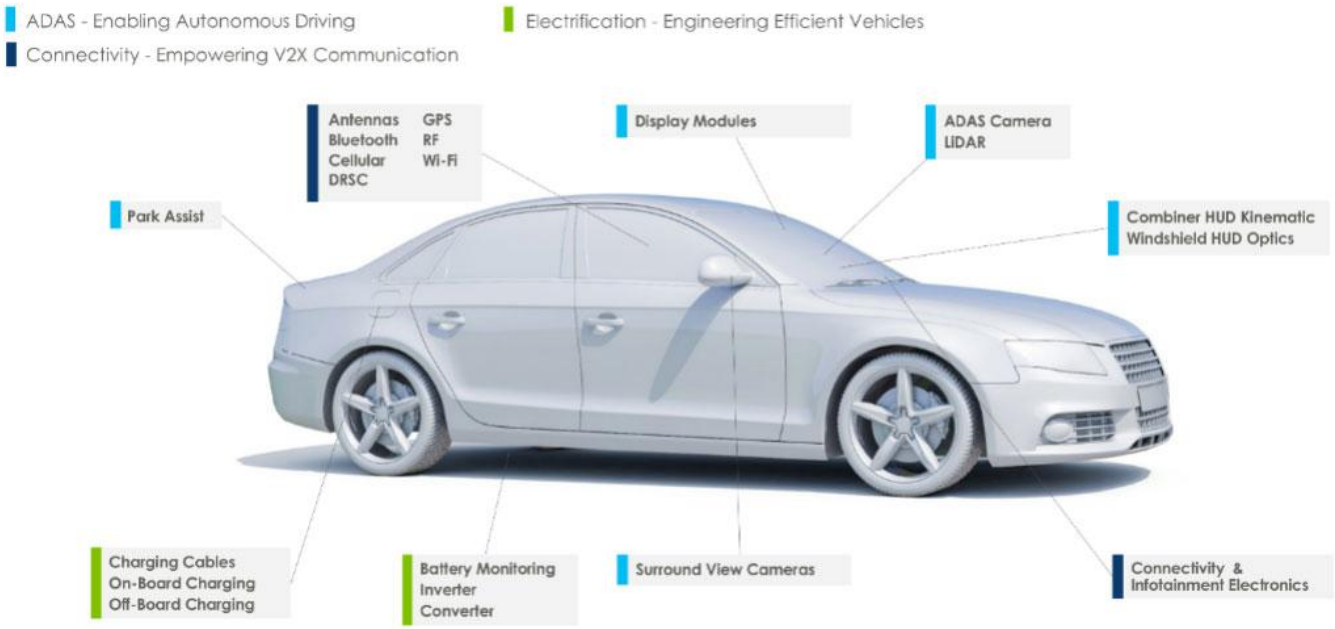
Unlike other products iatn CES, what is fascinating with cars is that by integrating technology at such a fast pace, they fully express upcoming aesthetic trends, shifting from *surfaces that embed 'intelligence'* to *'intelligent' surfaces*. Instead of just screens and overwhelming visuals, Peugeot proposes a tech composition for future car interiors to the benefit of all senses. Equally, design director Matthias Hossann and his team have tried to fulfill a giant task: dial knowledge into physical substance, while presenting through automotive design surfaces an extraordinary vision in the league of the most compelling industry trends in 2023. Technology and design together, fusing matter into senses.

Jerome Micheron, Peugeot's product director, said *'We are going to amaze with an unprecedented spatial organization of our future cars, we are going to simplify driving gestures and reinvent the driving experience.'*

News Mobility

Connected Cars and Infotainment, Mission Critical

NEWS MOBILITY



JABIL IMAGE

Jabil is an American worldwide electronic manufacturing company. Headquartered in St. Petersburg, Florida, they are one of the largest companies in that field, Jabil has around 100 plants in 30 countries, and 260,000 employees worldwide.

Jabil's automotive and transport general manager and vice-president Trevor Neumann thinks automotive connectivity is mission-critical, for it hinges on the internet of things (IoT). Even home appliances have changed with the advent of the smartphone, which is now having an impact on cars and on telecommunications. He says, "The mobility experience is changing from a means of transportation to a connected experience that is consistent with our ever-changing digital lives. The consumer expects more and more. So, anything that is electronic needs to be connected…there is a need for a high level of understanding with the customer and regulators to manage customer and vehicle privacy. Automakers need to have the ability through data analysis to understand which features and functionalities are being used. This can bring significant value to automaker's ability to create future product roadmaps and can enable them to address quality issues before they occur, to better manage preventative instead of responsive vehicle safety".

Connectivity and V2cloud technology is crucial for ADAS and any kind of emergency connection. However, as digital tools, are deeply embedded in our lives, software-defined vehicle infotainment, navigation, commerce, and digital cockpits also become crucial, as safety and security are involved.

On-Demand Mobility Ecosystem

NEWS MOBILITY

ROBOT TAXI IMAGE

The Routing Company (TRC) announced the launch of Pingo Journey, which offers users on-demand transit and end-to-end journey planning in one app.

It delivers Google Maps functionality while giving transit agencies control of on-demand dispatch. The app is the latest in a growing list of products, such as Citymapper and Moovit, that offer users data for end-to-end multimodal journeys and enable them to purchase on-demand transit tickets and link up with all other transit modes in the city.

According to Shwetha Surender, director of future mobility at Frost and Sullivan, a service that offers users the ability to plan, book and pay for their journeys seamlessly will be an essential part of future on-demand mobility systems.

Adam Kozłowski, head of automotive R&D at Grape Up, said that not only will Google Maps eventually be a major player of on-demand mobility but it will also provide the best user experience. "There is the core navigation functionality, including Points of Interest and support for multimodal transportation routing, the combination of on foot, by train, bus and so on. There is also integration with micromobility, and even for some time with Uber. That's basically half of the required features."

Another reason is that: "the applications are integrated in most of our smartphones and in near future [will be] in some of our cars. Having exactly the system both on-board of the vehicle and on the smartphone is a great user experience and may even result in Google and probably Apple becoming market leaders in this field", he said.

Other stakeholders will also want to enter this market. For example, in 2015, Uber bought mapping start-up deCarta and acquired a large piece of Microsoft Bing's mapping assets. That same year, Mercedes and Audi purchased Nokia's mapping service Here. Then there is the public transport sector, which is already active in this area. "The app which can integrate most of the third parties under a single umbrella gets the biggest piece of the cake," Kozłowski said.

General News

Volvo Fully Acquires Zenseact

GENERAL NEWS

VOLVO IMAGE

At the end of last year, Volvo Cars bought 100 per cent of their software development subsidiary for autonomous driving, Zenseact. With the purchase, Volvo wants to secure full access to software development. Zenseact was founded by Volvo Cars and has offices in Gothenburg, Sweden, and Shanghai. It will remain as an independent company, according to Volvo.

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Zenseact develops safety, driver assistance and autonomous driving technologies for interaction between people and vehicles; for example, digital cockpits, operating systems or infotainment head units. Zenseact developed the OnePilot system for the electric Volvo EX90 last year, **as we reported**. This is AI-powered software that has been trained with data from real incidents. They were recorded by cars equipped with the system. The data is stored, and the system 'learns' and can assess threats, make decisions and verify accordingly, as well as amassing content for future updates.

Cariad's Contribution to Gaming, Health, Wellbeing

GENERAL NEWS

CARIAD IMAGE

Making their first appearance at CES this year, Volkswagen Group's software company Cariad presented their new American tech hub. Since the start of this year, around 300 Cariad experts have been working on the automotive cloud, digital experience and automated driving functions in Silicon Valley and the Greater Seattle area. Cariad also used this opportunity to recruit tech talent. The highlight at their booth were the tech talks: experts presented the Cariad path to $L^{3\text{-}4}$ automated driving; explained the tech platform for the software-defined car, and gave insights into future in-car infotainment with gaming, health, and wellbeing features as well as software as a revenue driver.

New vehicles were on display to support this new step: the VW ID.Buzz; Audi RS e-tron GT, and Porsche Taycan. Cariad was also represented at the CES booth of the Volkswagen brand; the new ID.7 was launched with the next generation of ID software developed by Cariad.

Cariad was also involved as a sponsor for the Indy Autonomous Challenge, in which university teams competed against each other with their automation software for racing cars. Visitors to the Cariad booth were also able to register for virtual reality experience drives in the Audi e-tron; Audi was the world's first automobile manufacturer to bring holoride's VR entertainment into series production. The technical prerequisites for this were developed by the Cariad team.

Videos of Cariad's team of experts from CES are now available on YouTube: **in-car entertainment and software as a revenue driver** with focus on gaming and health and wellbeing, as well as videos for automated driving and tech platform for the software-defined vehicle.