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Weekly Newsletter

DVN-I
Automotive Interior

NEWSLETTER #114

Editorial

More And More Clamor For Voice Technology

TOPAUTOTOOLS IMAGE

Voice control of vehicle functions and features is the topic of this week's in-depth article. We hear more and more about voice technology, as the technology is maturing and electrification makes for much quieter cabins.

Speech recognition in vehicles has been around for two decades—the 2001 BMW 7 Series offered it—but it's a tough challenge. Road-wind-powertrain noise make it hard for a machine to accurately 'hear' and parse what the driver has said. Even the best AI can't really use context clues as humans can, and so rather than reducing distraction for the driver, voice control often just made a frustrating nuisance of itself because the environment was just not appropriate.

As increasing numbers of new cars run on electricity and active noise cancellation is proliferating, squeaks and creaks and rattles that used to be masked by what was normal ambient noise are exposed, and subsequently silenced. It's a good feedback loop making car interiors less and less noisy, thus quietly paving the way for tvoice control to finally let drivers use the features they want while keeping hands on the wheel and eyes on the road, and consequently simplifying HMI design.

The first DVN Interior Think Tank Seminar will focus on HMI (as well as lighting and sustainability), including exploring as a group how new technology will make voice command safer, more intuitive, and accessible to all. It is now tentatively planned for Köln on 15 November. We'll continue to inform you as we develop the event. How does the idea strike you? What would you like to see and do at the event? Please **send us your thoughts**. In the meantime, enjoy this week's newsletter!

Sincerely yours,

Philippe Aumont
General Editor, DVN-Interior

In Depth Interior Technology

Is Voice Control the Future of the Industry?

VOICEBOT IMAGE

The pandemic disrupted and reset things in a lot of ways. Physical distancing became the new norm, and that's difficult to do on most modes of public transit, so a personal vehicle grew in perceived value as the safest way to travel (with proper cabin sanitization, of course). And that's in context of the pervasive shift towards more and more touchless controls, in automobiles and everywhere else.

One of the hottest trends in the automotive market is voice control: a simple voice command could raise the volume on your sound system; change the HVAC temperature or air source; turn on the cabin lights, set a course for a new destination…theoretically, just about anything that can be achieved with buttons, knobs, dials, or touchscreens could also be done by voice control.

According to a study published by Voicebot in January 2020, 129.7 million people used voice assistants while driving, a 13.7-per-cent rise from September 2018. And analysts at Frost & Sullivan predict that the importance of digital voice assistants in automotive branding will carry on growing at an accelerating rate; according to JD Power, 76 per cent of people who try voice control want it in their car, and nearly 80 per cent of Americans say they want the same voice valet in their car as they have in their home.

In that context, this week we review the latest technology and technique and how voice control is transforming HMI.

The CASE megatrends (Connected-Autonomous-Shared-Electric vehicles), together with the comprehensive adoption of a smartphone environment in cars, are the key factors causing voice control to gain increasing traction in the automotive sector. Other push-factors include an increase in disposable income (at least for those who already had quite a lot of it), and ongoing technology integration to support centralized functionality. Vehicle cabins are growing quieter with augmented and improved acoustics. This facilitates a better experience with voice control, for the user's commands won't be degraded by background noise, and of course the newest voice recognition systems are markedly better than ever before.

Voice Technology Benefits

HYUNDAI IMAGE

Voice recognition that works helps reduce driver distraction and increase in-car safety and comfort. It's about facilitating everything you can already activate in a car—music; that telephone you're really not meant to be using while driving; navigation, HVAC, and all the rest. But the real big step would be in-car voice control to enable conversations with your vehicle about nearby roads; weather; stores; restaurants, and suchlike, along the lines of the question-answer-command-comply conversations characters in "Star Trek" have with their ships' computers. This kind of natural dialogue is where things start to get really interesting. The promise of such voice system is that the driver or passenger will be able to converse far more naturally with their car's infotainment and navigation systems. This two-way conversation with the car would inevitably integrate your car (even if it isn't *your* car, but a shared one) closer into your life.

Examples: a conversation about points of interest or real-time road conditions; drive commands like 'follow that taxi'; ordering a coffee on the go or easily booking tickets for an event…communication with home or office to turn on the lights or start cooking supper. A near-future scenario would be with your voice-controlled 5G-connected, sensor-rich car responding instantly and conversationally to you in accord with the dynamic situation outside the car.

At base, voice activation means the car is operationally responsive to an occupant's voice. It is being embedded in everything—smartphones, voicemail/call-director systems; personal assistants, kitchen appliances—but really, the automotive industry is the embodiment of this universal adoption. Consumers are becoming ever more accustomed to having conversations with their technological surroundings, with nearly 94 per cent expecting to use them at least as much next year as this year; clearly our entire digital ecosystem is moving much closer to a voice-based foundation.

The high price of *good* voice recognition systems; data security concerns, and the need for such systems to respond correctly to any and every voice that might expect to operate it (different languages, yes, but also different accents; dialects, and vocabulary within any given language) are major challenges for the growth of the automotive voice recognition market. But the cost is expected to trend down, as wider implementation will lead to increased demand as well as economies of scale on the production side.

Technology

MOTABILITY IMAGE

Fifteen-twenty years ago, voice commands in cars **didn't work very well**. Last year, they still **had problems**. One had to use stilted, preset phrases to navigate a series of menus: Navigation. Destination address. City. Street. Number. None of it was intuitive; the systems were balky, and the episode usually ended in frustration. But cars didn't have the memory and computing power to handle much more.

The arrival of more reliable voice technology is revolutionizing the in-car experience, giving drivers hands-free access to more features and apps so they don't have to fumble with buttons or screens while driving. Now a driver can say, "Alexa, I'm cold", and the car will adjust the temperature. Or, "Alexa, take me to the nearest Starbucks", and the car will navigate there.

Automotive voice recognition systems consist of regulators of communication systems assimilated in the car infotainment system comprising a telephone, audio devices, and objective involvements for navigation.

AMAZON IMAGE

Natural Language

Progress in AI and machine learning allow the car to understand what the driver said, but also do a better job of guessing the intent, and respond accordingly. Plus, the vehicle can remember what to do next time. Systems presently installed are mostly limited to a set of voice commands—though sometimes there are as many as 10,000 of them in the set—and canned responses that can be used to activate and control some of the car's features, like the GPS; the entertainment system; the environmental controls, and the phone.

Sound Environment

Voice automation in vehicles involves the cabin environment. When you're driving at high speeds, tire-road-wind noise can make it challenging to have a conversation. There's a lot of postprocessing done by human conversation participants, using tone of voice, facial expression, and other context clues to comprehend what was said and what was meant. For the time being, no amount of artificial intelligence or machine learning can do this as well as human beings. But now is not forever! Technology can filter out ambient noise in the car to focus on the human voice.

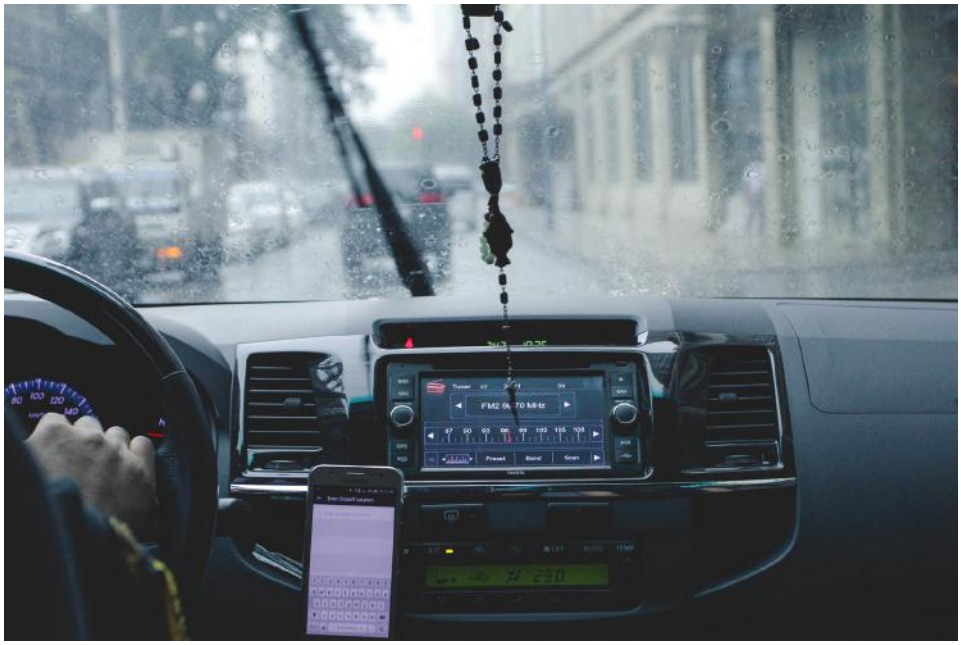
Connectivity & Cloud

Improved computing in recent years is making inroads. Access to the cloud provides another crucial benefit; cloud computing services and improved computational power further pave the way for voice control of cars. 5G technology could change the way we think about driving. If an AI-powered digital assistant is along for the ride, then it could be a revolutionary step forward for the automotive industry.

Privacy

If this technology knows where and when we usually drive, can it provide helpful insights, or does it create privacy concerns that must get addressed? It does both, really, and we'll have to figure out how to mazimize the benefits and minimize the drawbacks. There are other security angles, too: voice recognition can authenticate the speaker's identity—an additional security layer for operation of the car only by authorized individuals? Probably. Does it bring a risk that the system won't recognize a permitted operator if they have a cold or laryngitis or some other condition like that? Also probably. There is work to be done on these exciting challenges.

A well-populated ecosystem



NUANCE IMAGE

Tech giants like Apple; Google, and Nuance are reshaping the way voice activation is used in vehicles. Their systems enable drivers to activate and adjust HVAC; find directions; send emails; make phone calls, and play music—all by speaking to the car. Apple's CarPlay brings a stripped-down and safety-focused version of iOS to a car's touchscreen, with Siri fully integrated. In summer 2019, Apple announced they were opening Siri and Apple Maps to developers. Soon, CarPlay users will be able to send messages through WhatsApp; make calls via Skype, and book reservations through Apple Maps without having to launch those apps.

Google's Android OS dominates the global smartphone market, though, and Android Auto offers a pared-down version of their phone screens on the vehicle dashboard. Some years back, the platform went through a major redesign, and now over 70 new cars have added support for the platform— including new models from Stellantis; Volkswagen; Lexus; Audi; Ferrari; and Nissan-Infiniti.

Amazon also works with automakers but in a different way. With a mobile-app-based routing, Alexa ports requests through a smartphone to the cloud in cars made by Toyota-Lexus; SEAT, and Ford-Lincoln. Some Alexa skills allow for remote access to functions like climate control; fuel status, and remote start. And then there is the full-featured Alexa Auto SDK, available in some GM and Audi cars. This can replace the automaker's built-in voice assistant, as many brands are looking to offer access to Alexa because many new car buyers expect it.

Branding strategy

Ford was among the pioneers of connected cars: in 2007 the company introduced their Sync platform and Bluetooth connectivity for mobile devices and voice commands. Today's Sync 3 platform features integration with Amazon Alexa; Apple CarPlay; Android Auto, and access to third-party apps. Users can pair their vehicles with two Alexa "skills" and a Google "action". There is also the FordPass voice app that allows remote start-stop and lock-unlock, and provides information on the remaining fuel range and tire pressure. The platform continues to evolve, and Sync 4—which arrived near the end of 2020—offers a more personalized driver experience with a behavior-learning system.

BMW also has an embedded voice assistant called "Hey BMW" that also allows for integration with Android Auto; Apple CarPlay, and Alexa Auto. There's also a branded Alexa skill called "BMW Connected", which allows start-stop, lock-unlock, HVAC, and provides updates on fuel or battery level and vehicle range.

In 2019, GM became the first automaker to fully integrate Alexa Auto. GM allows drivers to choose between Alexa Auto and an embedded solution by Cerence, and they've introduced Alexa skills and Google actions for several brands. With the voice assistant skills, users can control temperature settings and door locks as well as get updates on fuel level. Also, GM is making a transition from a custom Android OS infotainment system to one based on Google Android Auto OS, so more new Google services and Google Assistant integration came to many GM brands in 2021.

At CES 2020, Honda debuted a voice assistant built on SoundHound's Houndify platform. The branded voice assistant will use conversational history; location, and other contextual information to help drivers, while also

running entertainment and environmental controls. Apart from that, Honda began integrating the "Smartphone as Brain" feature, which Bluetooth-connects a smart device to a motorcycle and enables drivers to control it via the voice assistant or with handlebar switches.

Business Perspective

According to Voicebot, whose mission is to aggregate the most relevant news; commentary; research, and analysis (sort of like DVN for voice-control technology), for the second straight year about 60 per cent of consumers say a voice assistant is a factor in their new car purchase criteria. That's a rise over the result of asking a similar question in September 2018. Over 20 per cent of respondents say the in-car voice assistant experience is either a *significant consideration* or a *requirement*. The 7.3 per cent who call it a requirement presumably would choose only a car that offers the voice assistant of their choice.

According to a group of research companies, the automotive voice recognition market is set to grow to around USD $4bn by 2027, at a CAGR of 20 per cent during the forecast period 2021-2027.

Pay-in-your-Car

In-car voice assistants have a huge potential for voice commerce, With voice on the go, retailers get yet another channel for customer interaction and drivers gain an opportunity to shop from the comfort of their vehicles. With Alexa, drivers will be able to pay for gasoline using their voice at 11,500 Exxon and Mobil gas stations in the U.S. To do so, drivers ask Alexa to pay for gas and start filling up, then Amazon Pay and financial tech company Fiserv will process the request from Alexa. Making a voice payment will not require any memberships other than an existing Amazon Pay account.

Another company to embrace voice commerce is SiriusXM with connected-vehicle services. Together with Visa, Sirius will introduce a new payment method that will require only a vocal request in the car. Most importantly, the new feature will apply not just to fuel but also parking and food bought from the car.

PAYBYCAR IMAGES

PayByCar is a leader in making possible in-vehicle contactless payments for connected cars—both new models and millions of older vehicles. Their mission: make in-vehicle payments easy; safe, and fast, using only a toll road transponder and a smartphone.

Automaker examples

JLR · Alexa

Jaguar Land Rover introcuced Amazon Alexa across their entire model range. As part of the automaker's Reimagine strategy, this supports brand intuitiveness for operating vehicle features and functions while keeping hands on the wheel and eyes on the road. Requests such as "*Alexa, navigate me to home*"; "*Alexa, play my chill-out playlist*", or "*Alexa, show me nearby coffee shops*" can all be done by voice, without touching the touchscreen. Alexa also lets users check the news and weather, and manage their schedule or shopping list, just by asking. It allows OTA software updates, too.

Engineers from Jaguar Land Rover and Amazon worked in close partnership to ensure the seamless integration of Alexa with Pivi Pro, JLR's in-car touchscreen control platform. This collaborative approach to development ensures that customers will enjoy the same Alexa experience in their vehicles as at home, and benefit from even greater functionality in the future.

Ford-Lincoln · Alexa

FORD IMAGE

Ford and Lincoln users can now teach Alexa to perform vehicle functions based on their preferred phrasing thanks to new, enhanced car control capabilities. The technology was first shown at the New York International Auto Show this past April.

With enhanced car control, customers can tailor Alexa to their natural way of speaking, and personalize Alexa to suit their everyday vocabulary. For example, if they say, "*Alexa, I'm cold*", Alexa will ask what action should be taken: "*I can increase the temperature by 5° or turn off the air conditioning. What should I do?*" Similarly, customers can teach Alexa personalized phrases to use with their familiar voice commands, such as "*Alexa, set the AC to full blast*" or "*Alexa, set the temperature to cozy*". In this case, Alexa will recognize the supported voice command pattern and seek clarification from the customer to learn what "full blast" or "cozy" means to them specifically.

The car talks back: Ford's directional audio safety alerts

FORD IMAGE

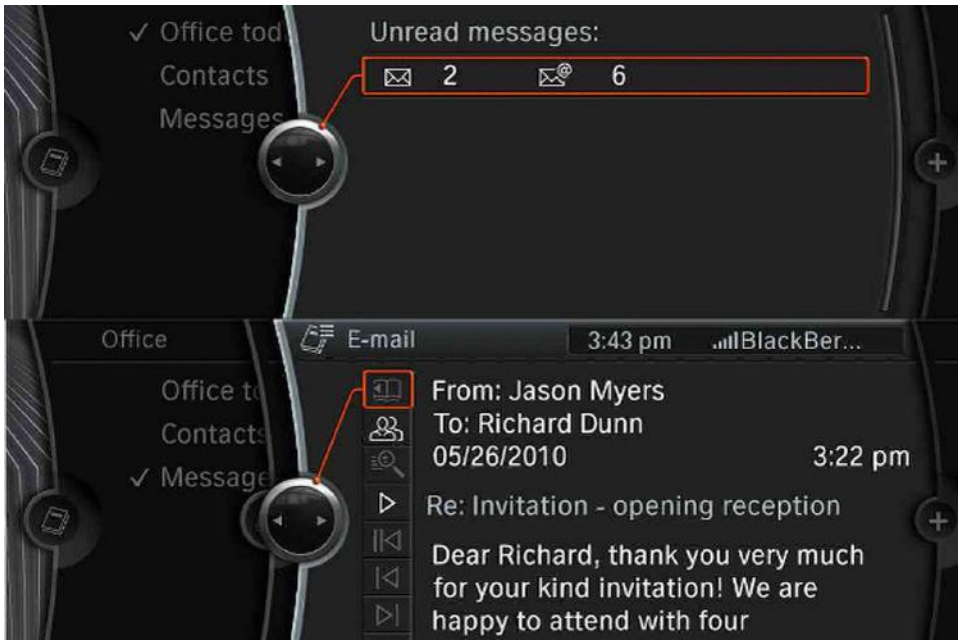
Dialogue is not only one way, your car can also talk to you, especially for safety alerts. Ford is developing smart driver alert technology within Sync, with visual displays and warning tones that mimic the sounds made by potential hazards. Engineers are testing the use of specific speakers to indicate the direction people and objects are approaching from, as well as trying different, intuitive sounds—bicycle bells; footsteps, and vehicle noises, rather than a generic tone—to warn drivers when other road users or pedestrians are nearby.

Ford vehicles already offer visual and audible alerts. Directional Audio Alert takes these warnings a step further; Ford-developed software uses the information from the sensors to select the appropriate sound and play it through the speaker closest to the obstacle, so as to direct the driver's attention correctly.

Tests in a simulated environment showed that drivers alerted by directional audio correctly identified the nature and source of the hazard 74 per cent of the time. Even just emitting a regular tone from the appropriate speaker enabled the driver to correctly identify the location of the object 70 per cent of the time. Engineers say these results might be further improved by using 3D spatial sound similar to that used in cinemas, and gaming techniques to better enable drivers to identify the source of the hazard.

Supplier examples

Nuance



NUANCE IMAGE

Nuance may be less of a household name than Apple or Android, but their purchase by Microsoft last year confirms their importance. Their technology first became available in the BMW 3 Series as BMW Intelligent Personal Assistant, an "AI-powered digital companion that enables drivers to operate their car and access its functions and information simply by speaking". it's a fine example of an AI developer and a car manufacturer coming together to create effective and innovative in-car speech recognition capabilities.

Nuance's conversational-AI powered mobility assistant platform is key to BMW's personal assistant, powering a multitude of features that are core to the in-car experience:

- Customizable wake word: Drivers can use the standard "Hey BMW" wake-up word or change the name of the assistant to one of their choice (should it maybe be "Okay, Bimmer"?).
- Voice-powered interaction: Nuance developed natural language understanding, enabling drivers to control key in-car functions, including point of interest search; navigation; temperature control; radio control, and weather.
- Smart, voice-activated car manual: available in US English; German, and Mandarin to start, with more languages coming. Drivers will be able to access the entire car manual using their voice. At last, a solution to increasingly unwieldy owner's manuals!

Drivers can express their emotional and cognitive states using natural language, like being stressed or tired. The BMW Intelligent Personal Assistant responds by switching several of the car systems into a mode appropriate for the situation.

Here

HERE IMAGE

Netherlands-based Here Technologies provides mapping and location data and related services. The company is majority-owned by a consortium of German automakers—Audi; BMW, and Mercedes—and Intel, with roots back to Navteq, now owned by Nokia.

Partnership between Here and Amazon Alexa was announced at CES 2019; the pitch was "Alexa already has your home, now she wants your car". As voice activation seems to be the next natural step of HMI and infotainement, what long-term benefits have yet to be discovered and developed (and what drawbacks are lurking, waiting to be solved)? That’s all in the future. In the meantime, passengers will soon be able to use Alexa to set their home environment as they’re arriving home straight from the car and control every aspect of the in-car entertainment experience with simple voice commands.

Interior News

Osram VCSEL in Melexis In-Cabin Monitor System

INTERIOR NEWS

AMS OSRAM IMAGE

AMS Osram will supply a high-performance infrared laser flood illuminator for the latest automotive indirect time-of-flight (iToF) demonstrator from Melexis.

The VCSEL flood illuminator from Osram's TARA2000-AUT family has been chosen for the new, improved version of Melexis' EVK75027 iToF sensing kit because it features an integrated eye safety interlock. This provides for a more compact, more reliable and faster system implementation than other VCSEL flood illuminators that require an external photodiode and processing circuitry.

The Melexis evaluation kit demonstrates the combined capabilities of the new system in combination with an interface board and a processor board and the MLX75027 iToF sensor. The evaluation kit provides a complete hardware implementation of iToF depth sensing on which automakers can run software for cabin monitoring functions such as occupant detection and gesture sensing.

The read-out circuit requires no additional components other than an AND gate or a MOSFET. This produces almost instant (<1 microsecond) reactions to fault conditions. A lower component count also reduces the materials cost compared to photodiode-based systems. By eliminating the external photodiode, the eye safety interlock eliminates the false signals created by objects such as a passenger's hand obscuring the camera module.

Melexis has a paper, **available online**, on the new illumination board for the EVK75027, describing the benefits of implementing an iToF system with a VCSEL flood illuminator that includes an eye safety interlock.

Premium JBL Virtual Venue for Fiat 500

INTERIOR NEWS

FIAT IMAGE

The Fiat New 500 ‘La Prima by Bocelli’ will come equipped with a premium sound system engineered and designed by Harman under their JBL brand, in partnership with internationally renowned tenor Andrea Bocelli. The New 500 La Prima will also become the first city car to be equipped with JBL’s ‘Virtual Venues’ technology.

Featuring four venues selected by Bocelli, the Virtual Venues feature is stated to offer listeners a virtual-reality audio experience that changes the acoustic characteristics of the car depending on the chosen location, transporting listeners to unique listening environments. These include an intimate music-room setting; a precision recording studio, and an acoustic recreation of the Giuseppe Verdi Opera House at Pisa, Italy.

The sound system features seven high-performance speakers including two tweeters, two mid-woofers, two rear door full range speakers and one subwoofer in the trunk, plus an eight-channel amplifier with an output of 320W. It also includes JBL’s Virtual Center technology, which processes each speaker’s audio signal to guarantee a stereo stage with a center image directly in front of each listener.

Sennheiser-Continental Immersive Sound in New Morgan

INTERIOR NEWS

MORGAN IMAGE

New technological coöperation between Morgan Motor and Sennheiser aims to improve the interior audio of future Morgan vehicles, harnessing Continental Engineering Services' Ac2ated Sound system. Due to limited space; low weight requirements, and the fact that Morgans are open-top cars, sound quality development for audio systems has proved a challenge. The automaker says these difficulties will no longer be an issue thanks to Continental's hardware and Sennheiser's software working in tandem.

Continental's Ac2ated Sound system works differently from conventional speakers: selected surfaces in the vehicle interior can be triggered to produce sound. The result is an extremely natural and enveloping sound experience for the occupants, who feel as if they are sitting in a concert hall surrounded by sound. In comparison to conventional audio systems, Ac2ated Sound not only produces high audio quality but also enables a reduction of the weight and space taken up by up to 90 per cent.

Autoneum's Sustainable, Felt-Based Sound Insulation

INTERIOR NEWS

AUTONEUM IMAGE

The acoustic performance of a vehicle is always a compromise of acoustic sources and acoustic absorption, and constrained weight and cost.

With its new Flexi-Loft material, Swiss-based, Autoneum—experts in acoustic and thermal management—says they are offering a felt-based technology which, thanks to a blend of recycled cotton and functional fibers, reduces product weight and allows for accurate adaptation to complex shapes. The textile material provides a versatile and more sustainable alternative to foam.

In car interiors, standard thermoplastic felts excel through their acoustic absorption, robustness and environmental friendliness. However, since felt-based materials are generally less voluminous and moldable as foam components, they require more weight to thoroughly fill the areas of varying thickness between the surface of the component and the vehicle's body-in-white. In contrast, Autoneum says their Flexi-Loft technology is significantly lighter; more flexible, and more adaptable than standard felts. In addition, the fiber-based material is versatile and outperforms current foam products in terms of sustainability.

A blend of recycled cotton and polyester fibers, says Autoneum, makes components with Flexi-Loft much lighter while improving geometrical adaptability and acoustic performance, especially in areas of low thickness. Thanks to the specific properties of the fibers, Flexi-Loft enables a precise adaptation to a wide variety of vehicle bodies, thereby improving the noise-insulating qualities of the respective product. Even at low weight, Flexi-Loft covers a wide range of material thicknesses, making it a decoupling material for interior components with complex shapes such as inner dashes and automotive carpets.

The material offers high environmental performance throughout the entire product life cycle while offering the same benefits as less sustainable foam alternatives. Flexi-Loft consists of at least 50-per-cent recycled cotton fibers, and offcuts from the manufacturing process are reclaimed, processed and then reused in the production of new felt blanks. Furthermore, the material is fully recyclable.

Autoneum is already using Flexi-Loft worldwide as an insulator for various carpets, inner dashes and other acoustic components based on their Prime-Light technology. The material will first be applied as an effective decoupler in inner dashes next year in Europe.

Hyundai VR for Simultaneous All-Around Development

INTERIOR NEWS

HYUNDAI IMAGE

Hyundai has recently highlighted the advances made in the use of VR technology by their design and development teams on new vehicle projects. Designers work with industry-standard software specially modified so that they can work in collaboration across multi-user and multi-location environments.

Using this software, they can create models and immersive environments in VR. This, the company says, has opened up a host of new opportunities. For example, what is known as a gravity sketching tool enables designers to create more human-centric vehicle designs by working in 3D from the start. By working in 3D, Hyundai's designers can experiment with different proportions and build variations. Meanwhile, a 360° view of the vehicle enables them to sketch from any angle, in contrast to the traditional 2D process.

3D gravity sketching also enhances the collaboration between Hyundai's exterior and interior designers, as the two teams can now work together simultaneously. While the exterior design team refines the digital model, the interior designers can work in parallel by virtually stepping inside the car to develop features or make quick adjustments.

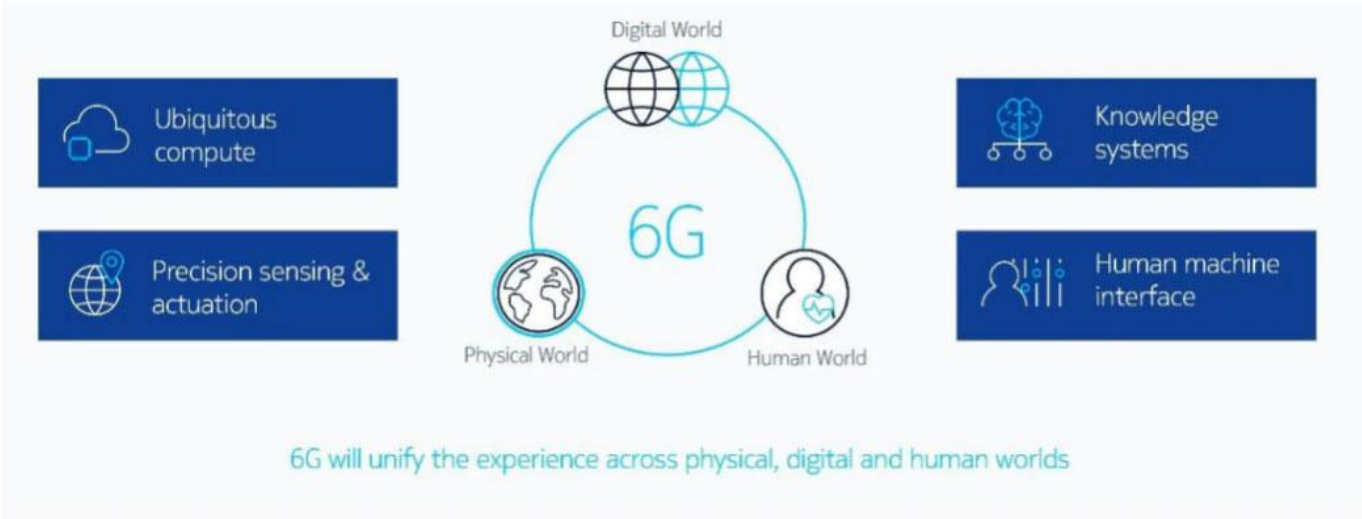
VR headsets enables staff from various departments to enter a virtual conference in real time and simultaneously undertake vehicle design quality assessments and development verification processes, no matter where they are in the world.

Hyundai has also established remote VR design assessment capabilities to enable real-time virtual collaboration among their design centers in Europe; Korea; China; India; Japan, and the USA. These changes were already underway before Covid-19 emerged and sent the world into lockdown in early 2020.

The adoption of collaborative VR systems also means that staff at Hyundai's European Design Center, located at the Hyundai Motor Europe Technical Center (HMETC) in Rüsselsheim, Germany, can work in much closer collaboration with the company's global R&D Center in Namyang. The HMETC's Vision Lab has been completely renovated and is now outfitted with what Hyundai states is some of the most advanced design technology in the automotive industry, including 48 cameras with active tracking.

After 5G, Here's How 6G Will Change Our Interaction with Technology

INTERIOR NEWS



NOKIA IMAGE

Mobile operators are accelerating the rollout of the flexible, low-latency, multi-gigabit-per-second communications network known as 5G. The technology promises not only faster data rates, higher reliability and low latency but also a more flexible and programmable network.

In parallel, next generation is in development, 6G. The hope for 6G technology is to enable a ubiquitous, seamless Internet that not only connects people's devices to the network, but also enables sensors, vehicles and many other products and technologies to communicate smoothly and reliably with each other.

The differences between 5G and 6G are not only in what collection of bandwidths 6G will make up in the future and how users will connect to the network, but also in the intelligence built into the network and devices. Devices need to switch between different frequencies, match data rates, and adapt to the needs of the application at hand, which may be running locally, at the edge of the cloud, or in a public service. Very key for HD map, OTA, Payment, 6G will also usher in a confident network capable of supporting and facilitating new technologies that are struggling to gain a foothold today - virtual reality and augmented reality technologies, for example, and self-driving cars. Artificial intelligence and machine learning will be integrated into 6G from the outset to simplify technical tasks such as optimizing radio signals and efficiently scheduling data traffic.

Adding sub-terahertz bands to the toolbox of wireless communication devices could open up vast networks of sensing devices, high-fidelity augmented reality and locally connected vehicles. In addition to different frequency bands, current ideas for the future 6G network must use new network architectures and better methods for security and reliability. Furthermore, devices will need additional sensors and processing capabilities to adapt to network conditions and optimize communications.

Nokia expects to begin rolling out 6G technology before 2030.

The Design Lounge

Genesis' New Design Language, As In the GV70

THE DESIGN LOUNGE

Genesis' new design language is shown here in the new GV70. It is embodied in the cabin's sleek lines; smooth curves; top-notch materials; and attention to detail, in context of plenty of advanced technology.

Materials are obviously premium, and eye-catching in the striking red-and-grey leather and suede interior. The carbon-fiber trim that adorns the door inners and center console gives the GV70 the panache of a luxury Bentley at, erm, a sub-Bentley price.

The transparent, cut-crystal-like gear selector is unique: It changes colors from blue to red to purple depending on whether the vehicle is in Drive, Reverse, or Park.

A flashy startup sequence; 16-speaker Lexicon sound system; massive sunroof; suede headliner; subtle interior lighting with more than a dozen colors to choose from, and window shades for the rear passengers button it all up.

The 14.5" center screen can be controlled through touch or via a stylized low-profile controller on the center console. The graphics are crisp, and you don't need to drill down too far to reach what you seek. Sounds of Nature, such as a crackling fire or sea waves, digital key and fingerprint authentication are other great UX features.

A 12.3" digital cluster complement the dash, with a 3D look to the gauges and readouts. It is complemented by a HUD that keeps track of vehicles in traffic around the car, some as far as two lanes away.

Fit & Finish has been thoroughly improved; just look at the close, consistent fit of the dashboard and door here.

Coffee corner is the place where DVN takes a morning break for automotive culture anecdotes; stories; mythology; jokes, and unwritten history, all in line with the long history of striving for of up-to-date technology.

THE Forward Collision-Avoidance Assist is one of the most important safety features available in the 2021 Genesis G70. It allows G70 to detect stopped or slowed vehicles in front of it, as well as pedestrians.

Harley J. Earl's last dream car, the Cadillac Cyclone xp-74 of 1959, remains a classic design reference remembered for its most striking styling cue, the double-dome front end. Its interior, accessible by two sliding doors and a pop-up dome roof, incorporated all sorts of avant-garde features such as console sensors that detected rain and deployed the one-piece bubble top and triggering the automatic climate control. The rocketlike black cones weren't just ornamental; they served a real purpose, for the instrument panel was equipped with what is even now considered up-to-date technology: a collision avoidance radar! 62 years prior to Genesis70. The distance between the vehicle and the object was calculated and shown on the meter. If a truck, for instance, was 100 yards ahead the warning system would blink on the instrument panel, then sound an audible alert which grew louder as the other car grew nearer.

News Mobility

Hyperion: Nvidia’s In-Car Multifunction Platform

NEWS MOBILITY

NVIDIA IMAGE

Nvidia has revealed several new developments in their ADAS and AD activities; notably related to Drive Map, which they call a multimodal mapping platform; and Drive Hyperion 9, their newest platform for software-defined AVs. It's being developed with intent to see it installed in production vehicles for 2026, and is built on multiple Drive Atlan computers to provide intelligent driving and in-cabin functionality.

The platform includes the computer architecture; sensor set, and Drive Chauffeur and Concierge applications. It is designed to be open and modular, so customers can select what they need. Current systems scale from NCAP optimization to L3 driving and L4 parking with advanced AI cockpit capabilities.

The Atlan SoC, Nvidia says, gives the platform double the performance of their current Orin-based systems, but with the same power consumption. Using Nvidia’s GPU architecture; Arm CPU cores, and deep learning and computer vision accelerators, it will facilitate the implementation of multiple deep neural networks with capacity for future developments to be added.

The platform will make use of this added computer capacity by compatting with a wider range of sensors than current systems do. Its upgraded sensor suite will include surround-imaging radar; better cameras with higher frame rates; two more side lidars, and improved undercarriage sensing with better camera and ultrasonics placement.

All in all, the Hyperion 9 architecture includes 14 cameras; nine radars; three lidars, and 20 ultrasonics for automated and autonomous driving, as well as three cameras and one radar for interior occupant sensing.

General News

Lear Buying IGB, Thagora

GENERAL NEWS

LEAR IMAGES

Lear Corporation, experts in seating and E-systems, has definitively agreed to buy I.G. Bauerhin (IGB), a privately-held supplier of automotive seat heating-ventilation-active cooling; steering wheel heating; seat sensors, and electronic control modules.

Lear headquarters is in Southfield, Michigan. They serve every major automaker in the world, and rank № 179 on the Fortune 500.

IGB is headquartered in Gruendau-Rothenbergen, Germany, with over 4,000 employees at nine manufacturing plants in seven countries. They've been providing thermal comfort products since 1976, and their products find work in a wide array of vehicle models produced by nearly all global automakers. IGB generated approximately €205m in revenue last year.

Upon regulatory approval and meeting the usual and customary other conditions in an acquisition such as this, Lear will acquire IGB for €140m in cash, debt-free. The deal is expected to close in the next six to nine months.

This second acquisition of a thermal-comfort products company will expand Lear's product capabilities into active cooling. (The first? Last February Lear bought substantially all of Kongsberg Automotive's Interior Comfort Systems business unit, Kongsberg.)

Lear President and CEO Ray Scott says "The acquisition of IGB furthers Lear's vertical integration strategy and advances our vision of being the leading provider of innovative thermal comfort solutions. Combining Lear's industry-leading seating expertise and Kongsberg's products and capabilities with IGB's cutting-edge technology will allow us to accelerate the commercialization of efficient, high-performance seating systems that are aligned with the key priorities of our OEM customers and consumers alike".

The IGB buy-up follows closely on the heels of Lear also having bought Thagora Technology, a privately-held company specializing in material utilization hardware and software technologies based in Iasi, Romania. Thagora's proprietary solutions will complement Lear's sustainable manufacturing processes by reducing scrap and lowering energy usage during production. In addition, Thagora's technology brings significant advances to manufacturing operations through engineering and logistics, including improved material traceability, and facility footprint utilization.

Aunde, TB Kawashima Expand Cooperation

GENERAL NEWS

TOYOTA IMAGE

Last year, Aunde and TB (Toyota Boshoku) Kawashima established a joint venture in India. Now the two suppliers' coöperation is being expanded to other markets with the aim to strengthen competitiveness on the world market for interior materials.

TB Kawashima Development is a Toyota Boshoku consolidated subsidiary for manufacturing and sales of interior materials and interior parts for transportation vehicles (fabric, artificial leather and other covering materials, seat cover and other trim covers, decorative parts). It is headquartered in Aichi, Japan.

The automotive industry is in a transformation phase, which is dominated by the topics of CASE and MaaS (Mobility as a Service), the press release states. In connection with the growing awareness of sustainability, it is essential for interior suppliers to respond to these changes.

The content of the business alliance consists of mutual use of production sites and facilities, joint developments, and mutual supply of interior materials.