Thu, 28 April 2022
Weekly Newsletter

DVN-I
Automotive Interior

NEWSLETTER #109

Editorial

DVN Interior Köln Workshop: Grand Success

We did it—together! The first in-person DVN Interior Workshop happened earlier this week, wrapping up everything on Tuesday evening. Over 160 people attended, representing more than 80 companies including Bentley; BMW; Lotus; Honda; Hyundai; and Ford, Forvia; Valeo; Grupo Antolin; Toyota Boshoku, and numerous technology and materials companies. 11 companies had expo booths to showcase their products, applications, innovations, and technologies.

Everybody was happy to meet and discuss technology with peers after two years of abstinence! The docket of lectures gave a broad perspective on a wide array of technologies: HMI and IAQ; in-cabin sensing and interior lighting; surface interaction, materials, and sustainability. Really it showed there's a real ecosystem here; an intersecting web of technologies within the increasingly data-driven system to get the expected look, feel, functionalities, and reliability. It showed how technologies; new functions, and new architectures are pushing, pulling, and enabling one another in a positive feedback loop to create new opportunities and new design freedom for automaker and supplier architects and designers.

We heartily thank everyone who attended, participated, presented, and exhibited. Congrats to the Innovation Awards winners! The whole DVN team worked hard to bring this event together, and we couldn't have done it without all of you. We hope to see you all at the next DVN Interior event, so keep an eye on the weekly newsletter!

Thanks again. We're honored to have you as DVN Interior members.

Sincerely yours,

Philippe Aumont
General Editor, DVN-Interior

In Depth Interior Technology

DVN Interior Köln Workshop Day 1

The DVN Interior Workshop took place earlier this week at the Pullman Hotel in Köln, Germany. Over 160 people attended; there were two keynotes and 28 lectures, and 11 companies showcased their products in expo booths.

The event rubric **Experience Interior • Technology for Safety, Comfort, & Fun** was discussed at length by top international experts over the run of this day-and-half conference and exhibition. This week we're summarizing day 1; you'll find coverage of day 2 next week, and we'll put everything together in a complete report later on.

Innovation Awards Winners

The DVN Interior Ceremony Awards took place during the gala dinner, at the end of Day 1 in Köln:

Best Exhibition Booth winner is designLED Products Ltd, a Forvia Faurecia Company with Dr James Gourlay and Martin Walker

Personality of the year is Han Hendriks from Yanfeng (Recipient is Dirk Blomeyer, as Han was engaged with customers)

Best (100 Newsletters) Innovation winner is TactoTek with Olimpia Migliore and Karthikesh Raju

Best Lecture to Lumentum, with Matt Everett, and Pascal Segond

Congratulations to all winners! Thanks to all attendees for their applauding support!

Keynote I · Forvia

FORVIA INTERIOR CONCEPT (FORVIA IMAGES)

Forvia's design VP Andreas Wlasak gave the first keynote. His perspective on human-centered solutions for future mobility looked at car interior development through the creation of space.

Space means opportunity for automakers, as car architects, to use this space for whatever fulfills their vehicle objectives; it means design freedom for their designers. But development has prerequisites and constraints, starting with sustainability—material and technology-enabled architecture aiming at emitting less 30 per cent of CO_2 versus conventional techniques. It's materials structured around woven natural fibers; artificial leather with recycled and natural-fiber content; radiant panels for efficient cabin heating. It's heated windshields for heat-only-what-you-need-to-heat defogging.

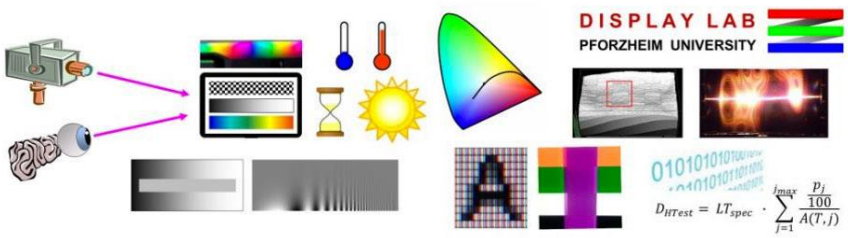
The cabin space is increasingly defined in terms of architecture, starting with a reduced dashboard package by 40 per cent in height and width, and almost 40 cm in length to maximize legroom for the rear passengers. New architecture also makes for surprising and convenient storage spaces, especially in the front passenger zone, with huge free space to package many convenience features, including a foldable work tables.

Space in the cabin means design freedom, and every centimeter an engineer saves is a new opportunity for interior designers. Not just up front, but also for rear passengers, where interior space can mean an opportunity for a 'business-class' or even first-class environment, so important when looking to mobility of the future.

Session I · HMI/HUD

HMI refers to the interaction between a human and a machine of any kind: hardware; software, or a mix of both. As a car is an ecosystem of interconnected systems and parts—machines—HMI is crucial for the automotive interior industry. It's where design and engineering intersect with customer experience. People expect seamless, permanent connectivity and interaction with their world during any boring commute.

Lecture 1 – Pforzheim University



Professor Dr Blankenbach from Pforzheim University presented what brings AR (augmented reality) into displays, and what are the related issues for comfort and safety while building trust in ADAS. AR comes from in-car augmentation, as in HUDs (Head-Up Displays): an augmentation of the view through the windshield to keep the driver's eyes focused with no need to flick and focus back and forth between the road and the car's controls and displays. Another example: transparent displays or embedded video in larger screens. It could come also from external means, such as headlamps providing road-projected symbols and information at night.

AR has to be part of the designed system, as it needs to know the exact positioning of the vehicle; the relative position of driver's head and gaze; the signals from camera-lidar-radar, and must be able to perform in any driving conditions (weather, bumps, latency). FOV (field of view) is a key parameter to

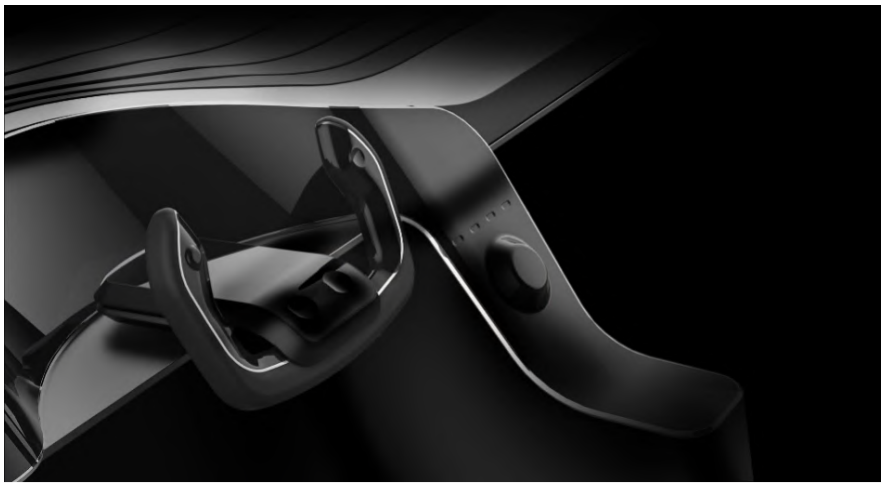
support user experience. FOV represents how much of natural human vision is covered. Today's good systems are equivalent to a 70” screen viewed from 10 meters!

Different technologies are possible: mirror HUDs; holographic HUDs; transparent displays, and more. Performance is measured through readability; occlusion, and comparison to the real-world view. Holographic is better, but needs massive computing power to support it—five times more than today's best.

Transparent display technologies include OLED; electroluminescence, and microLEDs; structure could go from simple (SEG) to more complex with matrix or projection. Video AR is easy to implement, and probably the cheapest solution. but creates a sort of second view where the driver's eyes need to refocus. As people age, the time to refocus increases (above 60 years, back and forth in 4 seconds, which is 130 meters at 120km/h!).

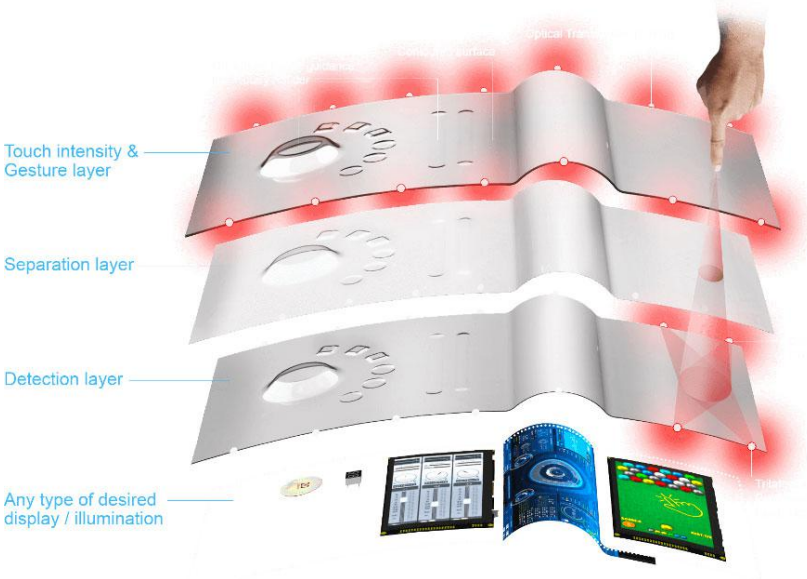
CMS (camera monitoring system) is a technology used in substitute of rearview mirrors, and drivers are getting used to it. With the different approaches and technologies, cost and ergonomics will be the selection criteria.

Lecture 2 – Uniphy



UNIPHY IMAGES

Jim Nicholas, CEO of Uniphy, emphasized the need for simplified HMI: "Drivers want technology that is safe and easy to use, but many of the features added to infotainment systems today have resulted in overly complex and sometimes frustrating user experiences". He compared the jumble of technology thrown at drivers to a dog's dinner. Uniphy technology, he said, should Unify!



Touch technology is today based on flat surfaces, and more design opportunities will pop up if touch surfaces conform to product shape. Therefore, there’s a need for 3D smart surfaces. That's what Uniphy proposes with their Beyond Touch™ technology for any plastic or glass, in any shape.

This multi-layer concept offers pressure sensitivity; haptic feedback; shy-tech compatibility (invisible when not needed); proximity detection for gesture control, and thin package space, all within the well-known prerequisites such as sustainability, ergonomics, and functional safety.

Uniphy technology uses commodity materials and mainstream manufacturing processes like multi-shot injection. There's no antenna, so no EMC issue. It's an algorithm-based technology, so the complete variety of UX features can be provided affordably.

Lecture 3 – Sigmasense

SIGMASENSE IMAGE

Sigmasense is a Texas-based, 5-year-old startup providing digital and fully-scalable sensing technology to solve the noise immunity and tuning challenges of traditional touch sensors. Gerald Morrison is CTO, and his lecture was entitledUnleashing a New Era of Adaptive Experiences.

It was centered around a chip able to use a variety of sensors, how you talk to a sensor. It is now the second generation of this silicone-based sensor. The car interior is an interactive environment, pillar-to-pillar, whatever the surface is, where systems transform your analog signal (touch) into a digital signal. Everything can be interactive.

UX changes when you can do something you couldn't do before. UX changes are largely driven now by sensing data. Sigmasense has a software-defined sensing solution to make data processing programmable and adaptative. They have a different way to transform analog in digital, based on current and frequency. It simultaneously drives and reads the sensor. One single central chip can drive 128 devices—sensors, switches, and controllers. The only issue is SNR (usually signal:noise ratio; here sound:noise ratio), as the car is a noisy environment.

The system captures an image, not just touch points. It allows, for instance, to touch with gloves, even under running water! It is a low-voltage, low-power system producing no EMI (electromagnetic

interference). Morrison showed an example using an 86" touch screen! Surely these kinds of capability opens new HMI solutions for future vehicles.

Lecture 4 – Preh

Matthias Lust from Preh spoke about haptic controls on touch screens. Preh is part of the Joyson Electronics Group, one of the 30 largest automotive suppliers globally.

Market feedback (through press) is showing that today's solutions are not the best. In Tesla's minimalistic cockpit, which is not intuitively controlled, operating many functions distracts the driver from traffic. So-called "Autopilot" and "Full Self Driving" are only camera-based assistant systems, and evidence (in the form of spectacular crashes) is growing that despite Elon Musk's claims, cameras alone aren't enough.

Another example: Cupra. The reactions of the 12" display are delayed; the menus are confusing, and the artificial sliders react nervously e.g. for volume control.

Touchscreens are becoming better; fast sensors and clear menu structure supports a good interface. However, standalone touchscreen should not replace buttons and rotaries

To reduce driver distraction Preh developed solutions that combine the flexibility of touch screens with haptic control elements. A first series solution went into production in 2020 in Ford's Mustang Mach E as a combination of a rotary knob with a 15,5” portrait touch screen. Further solutions from Preh, currently in development, are haptical marks and 3D overlays on the screen surface to reduce eyes-off-road time.

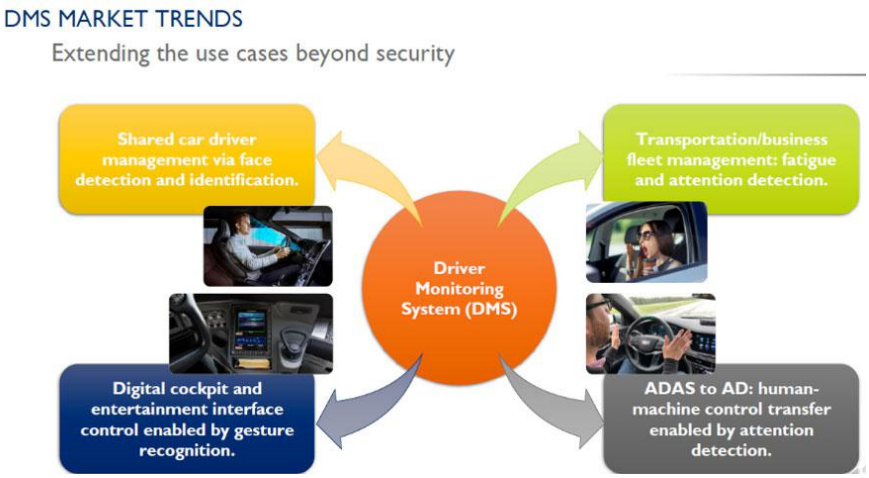
A big leap into the future is to use a rotary that can be attached to and removed from the touch screen. The operational possibilities are extensive; entire function submenus for audio; climate; navigation, and suchlike can potentially be controlled via turn and press selection, making the rotary actuator the central control element in the vehicle.

So, users comfortable with controlling everything via displays can be supported as well as the ones who will use a totally new HMI world by moving the knob on the screen to control functions.

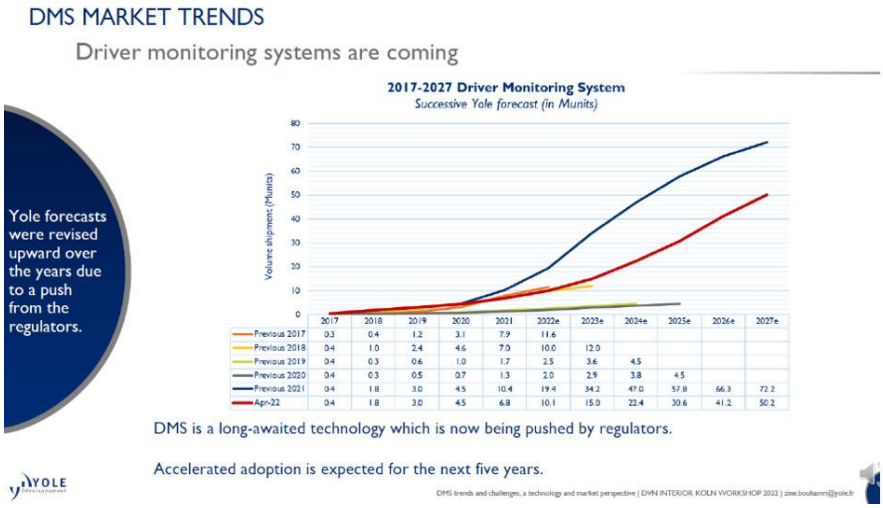
Session II · Driver Monitoring Systems

Regulators and consumer organizations are pushing the industry to improve safety with mandatory DMS. The planets seem to be aligned, as many companies—established suppliers and startups alike—are innovating to make it happen.

Lecture 1 – Yole



Yole's Zine Bouhamri set up the background of the topic with a quantitative market perspective and a review of the different technologies available today.



Regulation helps, as DMS will become mandatory in Europe starting in 2024. ADAS uptake is 58 per cent in 2021, and it is expected to be at 86 per cent by 2027. Cameras are gradually added to ADAS, including in-cabin monitoring (DMS/OMS) and exterior views. Three driver states should be detected: distraction (short term); fatigue (mid-term), and unresponsiveness (long term).

Different technological approaches are possible: bioelectric signals; steering motion, and face monitoring, to name three. DMS will be as good as the overall ADAS, and final decision will be made on a ratio of safety performance to cost.

Lecture 2 – Fraunhofer

FRAUNHOFER IOSB IMAGE

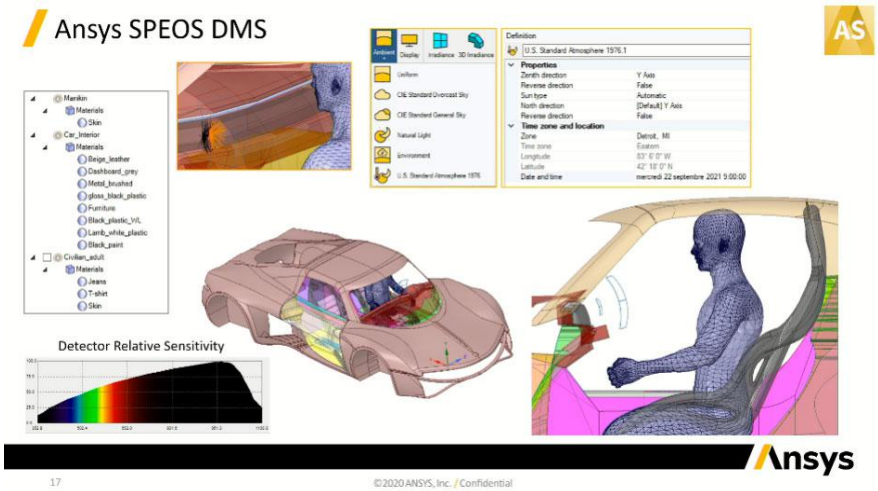
Frederik Diederichs from Fraunhofer IOSB (Optic and System) gave a lecture on advanced occupant monitoring for the most individualized place in the world. Fraunhofer developed interior camera

algorithms with body pose detection, using the richest and best annotated data set of vehicle occupants with very detailed occupant activities and locations in the interior.

It is part of the Karli project, which includes 10 partners: Continental; Ford; Audi, and others covering the whole value chain. The project target is DMS plus collecting data to carry on improving the system through a machine learning approach. It covers different interior architectures and different use cases; different sensor technologies (ToF, NIR, RGB), and different locations. Any company working on the topic is welcome to join the EDOM data collection project.

Advanced occupant monitoring systems and AI-driven interior sensing will allow vehicle interiors to become more intelligent. Knowing about the occupants' state—their activities, their history and intentions—enables advanced safety features and intuitive HMI solutions in the vehicle of the future. The passenger car becomes the most individualized place in the world.

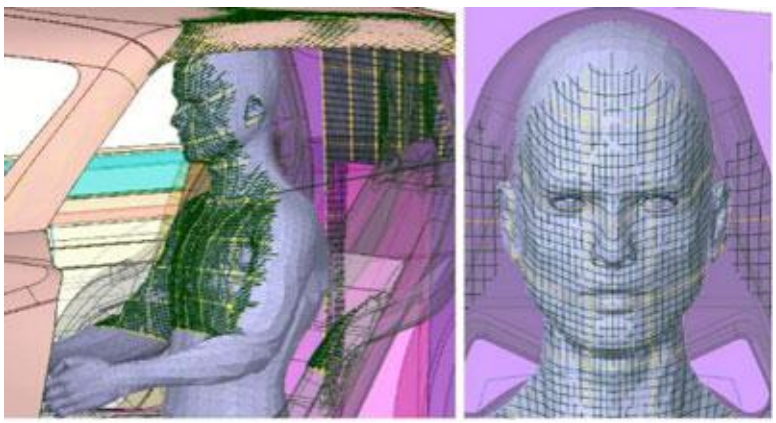
Lecture 3 – Ansys



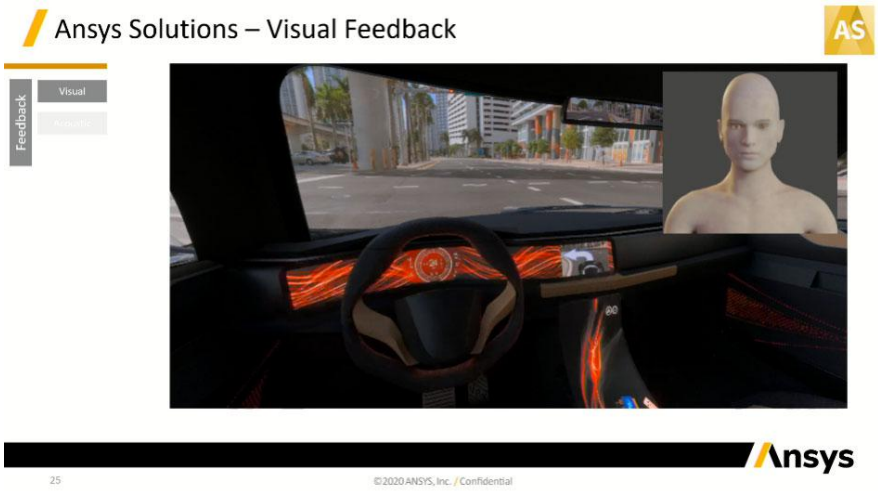
ANSYS IMAGES

Ansys senor application engineering manager Eugen Meier gave a lecture entitled Increasing Comfort and Safety of Autonomous Vehicles by Integrating Sensors Into the Interior Design. In it, he covered DMS overview and challenges; Ansys' optical solutions, and Ansys DMS.

DMS physical testing is a challenge, with very long testing time. It's difficult to cover all driving conditions, dangerous for testers, and regulatory immaturity is causing problems. Ansys' optical landscape covers components up to the complete system, going from the micro sensor to the macro system, including photonics simulation; optical system integration, and optical simulation.

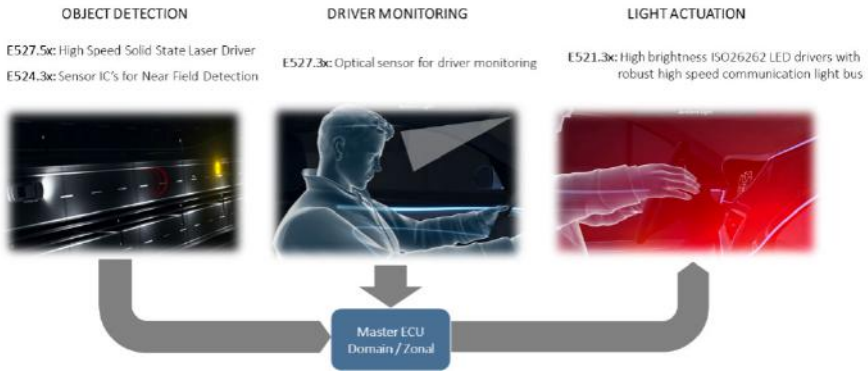


Ansys tools include meta-humans; camera-projected grids; sensor position; light sources; camera, and lidar. Simulation can include IR or thermal cameras (where the driver is the light source); silicon detectors; time-of-flight cameras, radar (among others, for seat belt reminders).



Feedback examples include blinking lights and also an audio solution, to simulate if it fits within the scenario.

Lecture 4 – Elmos



ELMOS IMAGE

Elmos is a semiconductor company. Their ambient LED Light controller is one of the most reliable and safety-oriented on the market. Interior lighting systems are expected to enhance styling, safety and user wellbeing, thanks to visual information display relevant to the driving experience in the cockpit.

It supports the integration of a complex systems involving sensors; lighting; materials, and software, linking DMS with interior lighting. It provides smart partitioning of on-chip intelligence and software at a system level. Communication is handled with appropriate bus technology, and component configurability provides maximum flexibility and scalability. It complies with functional safety requirements at the component and system levels.

Going beyond basic ambient illumination, lighting uses sensor integration to drive emotions, and to deliver safety through optical sensors. Integration includes compliance with ISO 21434 (Security of Automotive Software).

Lecture 5 – Lumentum

CHALLENGES OF AUTOMOTIVE DMS (LUMENTUM IMAGE)

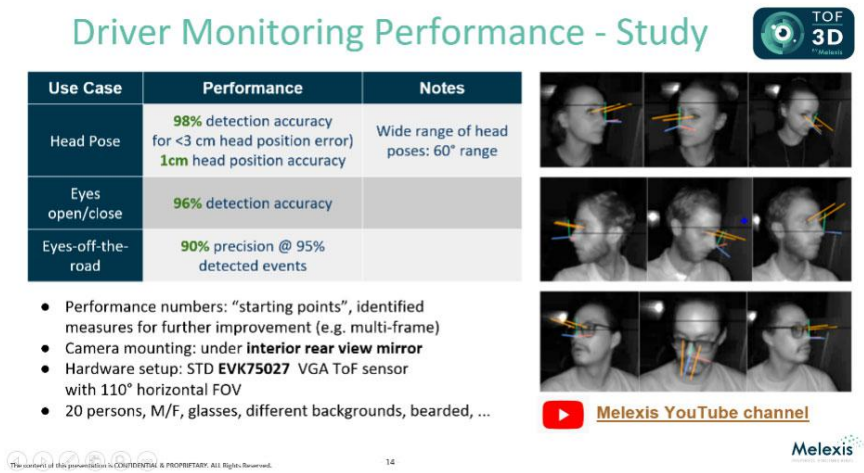
Lumentum product line managing director Matt Everett presented a lecture about VCSELs for in-cabin applications. Lumentum is a US-based provider of 3D optical sensing systems and a telecoms company, leveraging their experience; mass production capabilities, and reliability expertise for the benefit of the automotive sector.

Everett emphasized the importance of driver distraction as a societal issue. A timely topic, as April is National Distracted Driving Awareness Month in the US!

The in-cabin sensing market is driven by regulations for DMS and OMS. Integration of DMS and OMS needs high power and a wide FOV illuminator to get full sensing performance and longer sensing range for rear occupants. Challenges for in-cabin sensing are mostly related to lighting conditions, either when it is sunny and bright or at night in dark conditions.

A VCSEL (vertical-cavity surface-emitting laser) is a type of semiconductor diode with laser beam emission. Performances are well suited for in-cabin sensing cases. It can progressively replace LEDs, because of many benefits: compactness; reliability; signal to noise ratio, sensing resolution. It is now in production for high volume applications, and will support the transition from ADAS to autonomous vehicles, and increasingly sophisticated in-cabin awareness with biometrics, gesture recognition, and comfort management.

Lecture 6 – Melexis



MELEXIS IMAGE

Arthur Duhamel from Melexis made a lecture entitled DMS & 3D HUD Using Melexis iToF Evaluation Kit. Melexis delivers more than 1.2 billion ICs worldwide each year, including optical sensors. There are 18 chips in any new car, including time-of-flight gesture and in-cabin awareness. ToF has accuracy and data availability and reliability performance. It is already applied in many auto-interior applications for comfort; UX, and safety.

New ToF sensors bring high detection precision; low power; high ASIL levels, robustness to light variations, and cost competitiveness. ToF cameras can map a driver's hand, head, and upper-body positions in 3D, so as to ascertain if the driver is facing the road ahead and if their hands are on the wheel. It brings benefits of iToF for in-cabin monitoring, confirmed by the results of a demonstrator using a Melexis Evaluation Kit for DMS and adaptive HUD applications.

Interior News

COMFI Cockpit Concept From Hyundai Mobis

INTERIOR NEWS

HYUNDAI MOBIS IMAGES

Concept cars are to showcase what an automaker can do in the future. Major Korean supplier Hyundai Mobis has a futuristic new cockpit concept called COMFI, which they tout as an innovative cockpit for a comfortable driving experience. COMFI stands for **c**onvenient and **c**omfortable; **o**ptimized; **m**ovable; **f**unctional, and **i**lluminated.

Hyundai Mobis, the parts-and-services subsidiary of Hyundai-Kia, makes chassis; front-end assemblies; lighting components; cockpit modules, and replacement parts for Hyundai, Kia, and Genesis vehicles as well as other automakers.

Convenience and comfort features include a projection switch near the center console and an power-operated retractable table on the passenger side, with embedded keyboard.

Optimization factors include a "blooming sound" system with speakers that open outward and independently if needed. The knob controller under the screen slides into place as well, and the instrument panel features real wood inserts.

Movability involves just what it sounds like it might: movable components. The display for the sideview cameras slides into place; the 12.3-inch infotainment screen is movable, and the steering wheel has a pop-up function when the theoretical vehicle comes alive. Actually, it's a steering yoke, which could be hoped was chosen mainly to show off the display ahead of it; despite Elon Musk's scorn for "boring" round wheels, Tesla steering yokes are **much-hated** as unfit for purpose.

Functionality features include a polyvalent air vent which provides a "wind-free" mode depending on the passenger's preferences. The air purifier in the cabin doubles as a perfume diffuser—one could be forgiven for hoping this can be switched all the way off.

And *illumination* includes an elaborate 3D-pattern ambient lighting system and sophisticated lighting of controls and displays.

Hyundai Mobis notes that COMFI is a showcase integrating multiple technologies, all of which are production-ready. They have posted a show-and-tell **video online**.

Valeo's Neuroscience-Based Odor Neutralize

INTERIOR NEWS

VALEO IMAGE

Valeo says they've got the world's first neuroscience-based odor neutralizer for cars. It's called Odor Free, and it's based on the diffusion of a 'neutral fragrance' to impair the perception of unpleasant odors in the passenger compartment. Valeo collaborated with researchers at the Weizmann Institute's olfactory research laboratory in Israel to develop it.

Rather than pretending to mask bad smells by adding a perfume, Odor Free diffuses a neutral fragrance to modify the signal received by the brain, suppressing perception of the bad smell. The neutral fragrance overrides the perception of odors caused by people and pets—tobacco, food, sweat, wet-dog, and other suchlike—inside the car, especially when there are several people sharing the space.

The product will be available from the second half of this year as a medallion to hang from the rear-view mirror or a diffuser fixed to the central air duct. Private individuals will obviously be able to benefit from this technology (let us hope and pray it will shove aside those horrid, reeking, fraudulent tree-shaped so-called air "fresheners" currently inflicted on passengers in taxicabs, Lyfts, and Ubers), but it is aimed mainly at professional fleets, rentcars, and taxicabs. Theoretically, it can also be adapted for buses. Valeo is promoting it as a *solution for malodor neutralization in shared mobility*, and they're working more broadly on how to use smells to influence the driver's moods and alertness. They've put up an **online video** about Odor Free.

Altia's E-Tech Driver Display in the Renault Mégane

INTERIOR NEWS

RENAULT IMAGE

Altia, based in Colorado, make specialized software for the design and development of embedded displays with intuitive, highly performant graphical user interfaces.

Renault used Altia's HMI development software including Altia Design, a WYSIWYG graphics editor, as well as their DeepScreen automated code generator. Altia's software drives the displays of over 100 million vehicles worldwide, including many Renault Group models, and supports development of advanced 3D, multi-language, and functional safety—important for the new Mégane E-Tech EV.

The driver's cluster of the Mégane is particularly interesting. The panel features four different interchangeable displays, selectable by the driver as needed:

- Driving layout, showing speed, range and driving mode;
- Navigation layout, providing quick reference to a destination map updated in real time;
- Zen layout, with minimal essential readouts for simplicity, and
- Battery layout, showing the battery system's state of charge.

Using Altia's tools, Renault Group designers and their display supplier realized their HMI concepts with great accuracy and fidelity. They used Altia Layer Manager to manage the layer-based content, including 3D scenes for ADAS information; animated and dynamic background content; 3D car status animations; gauges, and driver and passenger information such as gear, speed, and charge; navigation maps and playback of video content.

Altia's software enables automakers to scale and iterate their designs to suit whatever needs and wants may present. Altia's efficient code delivers rich graphics with the lowest memory footprint and power consumption; this is especially crucial for EVs to maximize driving range.

Lincoln Star EV Concept: First Class on Wheels

INTERIOR NEWS

The new Star EV concept from Ford's luxury Lincoln brand is the first with the maker's new "Quiet Flight" design language set to debut commercially on four Lincoln EVs to be launched by 2026.

The Star has a highly raked roofline; unusual proportions, and a sumptuous, elegant interior. Its rear-hinged "suicide" rear doors hark back to the 1961 Lincoln Continental designed by Elwood Engel, and it's got interesting trunk and hatch configurations. The front fascia slides forward like a drawer, while the trunk lid opens upward-rearward. The drawer stows under the trunk's floor, and there's space above it for multiple pieces of luggage. The lid uses electrochromic glass which opacifies at a button-push, admitting light when the car is moving but hiding valuables while parked. At the rear, in a sort of clamshell arrangement, the glass is top-hinged and the hatch is bottom-hinged to provide a lounge seat.

A giant curved screen spans the entire dashboard, which itself is inspired by airplane wings. There's a smaller secondary control screen below the dashboard along with the "gear" selector buttons. The center console has a rotary control knob and door buttons. The interior is done up in maroon and white, with primo materials throughout: glass; leather-alternative textiles, and goldtone metals. Illuminated Lincoln logos are everywhere, and lattice patterns throughout. The A- and D-pillars use a 3D-printed

metal structure with a lattice pattern that affords a degree of transparency from inside the car, adding to the sense of airiness.

The front bucket seats have screens on their backs for rear-seat passengers, and they can swivel around to face the fixed second row when the car goes into autonomous driving mode and the steering wheel is stowed away—and it *is* a wheel, more or less, not a yoke. The sculpted, reclined rear seats have an integrated champagne fridge with glasses, extendable footrests with storage compartments for slippers, additional glass controls, and table trays. There's also the "Lincoln Attache", a hidden storage compartment in each of the rear doors where laptops and tablets can be stowed out of sight and wirelessly charged.

Lincoln says the Star has various "rejuvenation modes" which turn the car into an immersive digital environment of sight, sound and smell. *Coastal Morning* mixes sounds of the ocean with the smell of sea mist and dynamic lighting that mimics a walk along the beach at sunrise; *Mindful Vitality* uses up-tempo music with flowery perfume and soft lighting, and *Evening Chill* pairs an evergreen scent with videos of the night sky and calming sounds. Each mode was designed around the human circadian rhythm.

New Infotainment System in Lexus NX 450H+

INTERIOR NEWS

LEXUS IMAGES

The newest NX, the 450h+, is the first Lexus available as a plug-in hybrid. It's got an all-new multimedia and assistance system. Chief developer Takeaki Kato emphasizes: "The essential pillars of the NX are new: electrification; design; driving behavior, and technologies". The focus is particularly on the plug-in hybrid, the assistance systems and the infotainment.

The new multimedia system has a significantly faster computer; a 14” display, and free-text voice assistance for many vehicle functions and navigation that operates cloud-based for the first time. It's equipped for OTA updates; the Lexus app enables remote-controlled climate control, opening, and locking. Lexus places a lot of emphasis on intuitive operation—the switch count has been reduced from 78 to 45—in part by doing things like combining functions such as the air conditioning with the concierge program. The standard-equipment audio system is by Pioneer; spending more money gets the buyer a Mark Levinson surround-sound system with 17 speakers including an application-specific subwoofer.

The NX is equipped with Lexus Safety System +. It detects motorbikes and pedestrians and assists at intersections to avoid collisions with vehicles or people. The system also includes advanced adaptive cruise control; lanekeeping and guidance; cross-traffic detection; blind spot monitoring, and an emergency steering assistant. The electromechanical interior door handles lock if an object approaches from behind; if that's not happening at the moment, it can be operated with one continuous movement: just press the door button.

BMW X7 Has New Cockpit With Curved Display

INTERIOR NEWS

BMW IMAGE

The cockpit in the new X7 has a curved display combining the 12.3" instrument cluster screen with the 14.9" main screen. A head-up display is available as an option. The infotainment system, based on BMW OS 8, can be operated via touch; gestures; the iDrive Controller (a small lever, now, instead of the previous crystal knob) and voice control. Ambient lighting spans the redesigned dashboard.

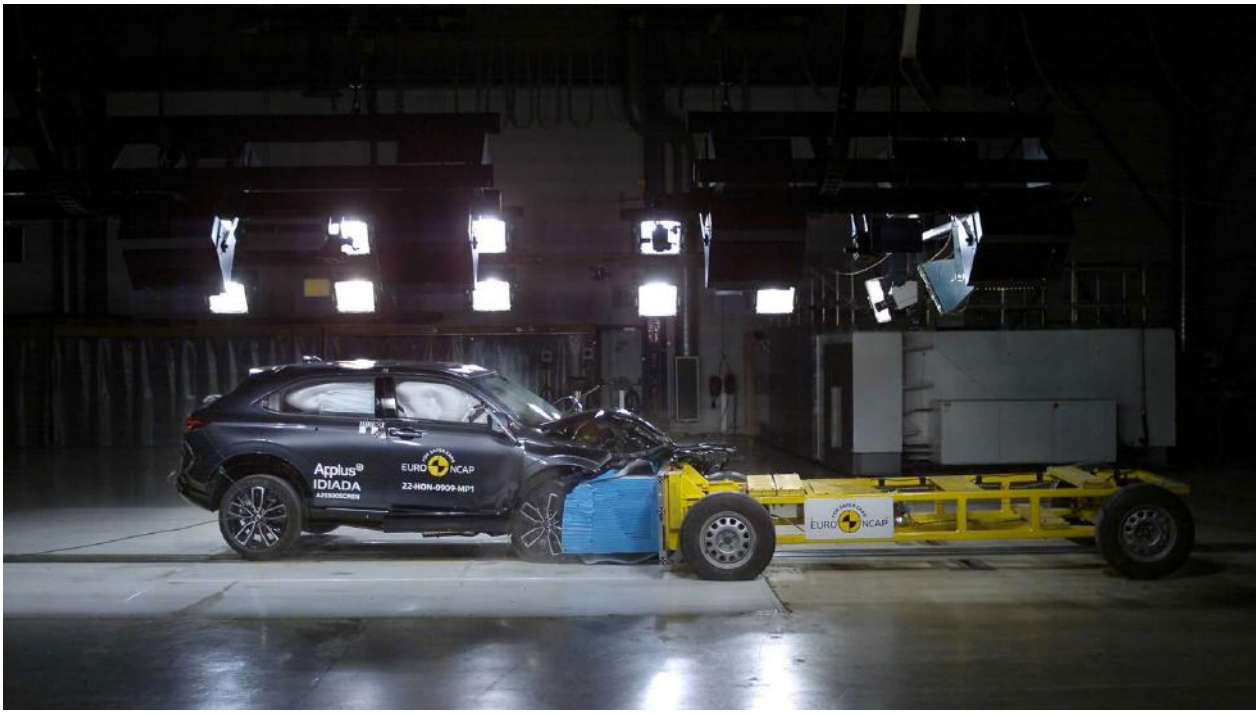
Merino leather upholstery is standard, as is 4-zone automatic climate control; a three-piece panoramic glass roof; high-comfort seats for driver and front passenger; a leather-wrapped steering wheel (an actual, real, round wheel) with shift paddles, and a new storage compartment for wireless mobile phone charging. The second row of seats offers space for three passengers as standard, or two individual seats as an option. The sound system is by Harman Kardon.

Options include a "Sky Lounge" panoramic glass sunroof, and a Bowers & Wilkins Diamond surround sound system. There is active seat ventilation and a massage function for the driver and front passenger. In the Comfort Package, the seats in the second and third rows are heated, as are the steering wheel and armrests.

News Mobility

Euro NCAP Raises Bar for 5-Star Grade

NEWS MOBILITY



EURO NCAP IMAGE

A five-star crash test result has been pretty much the norm for quite awhile now. But look below the surface, and we see that today's 5-star grade isn't the same as yesterday's. Almost every year the Euro-NCAP organization tightens the standard. In the past, a decent safety cage to route crash energy around the survival space inside the vehicle; airbags, and relatively weak pedestrian protection features were sufficient to achieve a good star rating.

That drove those design and equipment features to become more or less standard, so most reputable-brand vehicles got five stars. In order for the rankings to retain meaning and relevance, the criteria had to be made more stringent. Seat belt force limiters were added in 2001, and from 2003 the safety of children in cars was rated. In addition, the requirements for the body have been tightened.

While the focus has been on occupant safety in a crash, the Euro NCAP assessment is evolving towards a comprehensive assessment of the safety of a car. Instead of the previous maximum of 37 points, the testers now award up to 128 points. And instead of three individual categories, there are now four. In addition to occupant safety; child protection in the car; and pedestrian safety, the test now includes driver assistance systems. The newest tests: a whiplash test of the rear bench seat, to look for adequate protection against overstretching the spine when rebounding after a crash, and autonomous braking up to 50 km/h.

In the latest round of crash test, no vehicle scored the full five-star rating. The closest was the DS 4 with four stars for the basic variant, but its camera-based emergency braking assistant, which does not function optimally, caused demerits. A radar-based system is available at extra cost, which then also secures the fifth star.

The Honda HR-V also received only four out of five stars. The hybrid car showed slight weaknesses, especially in child safety in the rear. The Dacia Jogger did poorly, meriting onlyone star—NCAP says it needs many more assistance systems, including a seatbelt reminder for the third seat.

We're Ready for Level 3: Here HD Maps

NEWS MOBILITY

HERE IMAGE

Car manufacturers are working intensively on the implementation of L^3 autonomous driving, and high-resolution map material for intelligent and anticipatory vehicle guidance plays an important role to essential information that cannot be generated from sensor data alone.

Digital maps are one of the basic requirements for autonomous driving. Autonomous vehicles need near-real-time information about the road network and the corresponding traffic rules that permanently adapt to the current conditions. Here Technologies has therefore developed HD Live Map, which can detect changes in the road network in real time and update itself.

One of the most important capabilities is the constant exact location of the vehicle. It must know its own position at all times, especially in relation to other road users and objects on the road. The vehicle's own location is indispensable for autonomous vehicle guidance such as keeping the vehicle safely in its lane; initiating turning maneuvers, and avoiding obstacles. The vehicle must orient itself to environmental features; reliably detect obstacles, and identify vehicles ahead as such. Static objects for localization are continuously updated in a high-resolution map.

Here's cloud-based HD Live Map continuously records all the data required to locate the vehicle safely and accurately to the centimeter in its surroundings. This includes information such as the course of the road; its layout; markings, and characteristics of the lanes and traffic rules. HD Live Map stands out because it seamlessly combines the information it contains. This paves the way for anticipatory, autonomous driving including controlled steering movements, moderate braking and optimized lane changes.

Another advantage of maps is that they also contain detailed country-specific information, such as traffic rules that apply in a particular country. In addition, map data also includes speed limits not explicitly indicated by signs, and provides data on the road infrastructure that is still so far in front of the vehicle that it cannot even be perceived by the sensors. It is precisely this information that is indispensable for anticipatory, comfortable and safe driving.

Mercedes-Benz uses Here HD Live Map as an integral part of Drive Pilot, their new control system for L^3 automated driving.

Here is majority-owned by a consortium of German automotive companies—Audi; BMW, Mercedes-Benz—and Intel; other companies also own minority stakes. Its roots date back to U.S.-based Navteq in 1985, which was acquired by Finland-based Nokia in 2007. Here is currently based in The Netherlands.

General News

Nio Eyeing Phone Development

GENERAL NEWS

Chinese EV maker Nio's CEO William Li says his company is exploring the production of their own phones. The idea is to provide an all-encompassing system for consumers' daily lives, like Apple (seen by Li as a potential future competitor).

With sub-brands like Nio House membership clubs; Nio Power charging infrastructure, and Nio Life merchandise, the brand is already applied well beyond cars. This is deliberate, Li says, and will carry on with the goal of becoming a household brand.

The company plans to use their technology expertise and experience to create an even larger customer experience that may soon include mobile phones that pair with Nio EVs, a mirror-image strategy versus Apple's approach. Nio Mate, an AI-driven HMI for Nio's operating system, was **introduced in 2020**. This dashtop device that represents the vehicle's personality in the form of a head and face could be easily compared as smart phone embedded in the dash.

Mercedes Integration Factory is Electric Software Hub

GENERAL NEWS

MERCEDES IMAGE

Mercedes-Benz has a goal they see as a strategic pillar of the company: to lead in electric drive and car software. From 2025, all their new vehicle architectures will be exclusively electric. Around 1,000 new jobs are currently being created for software developers in Sindelfingen alone. Up to 2,000 more jobs are currently being added in the global R&D network. The Electric Software Hub brings together the two key strategic topics for the future of Mercedes-Benz and strengthens the role of the Sindelfingen site as a central development and qualification nexus.

Mercedes-Benz Group CTO responsible for development and procurement Markus Schäfer says "The Electric Software Hub is an epicenter of our research and development and at the same time closely networked with the worldwide production sites. This is where key aspects of the future of Mercedes-Benz become reality – especially our own MB.OS operating system. Cars are among the most complex products in general. The hardware and software are decoupled and must work together perfectly. We ensure this in the Electric Software Hub. It is our software integration factory".

On around 70,000 m^2 of space and eight levels, 19 cross-functional departments work on the electrics/electronics integration process. The upper floors house the software code creation and pre-integration laboratories with hardware-in-the-loop test benches. Floor 4 houses the mobile prototypes. The three lower levels are specifically designed for labs, workshops and other test benches. Mercedes-Benz chief software officer Magnus Östberg says "The Electric Software Hub enables us to integrate new software components into a production vehicle quickly and safely in an interactive environment".