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Weekly Newsletter

DVN-I
Automotive Interior

NEWSLETTER #206

Editorial

DMS And HMI Automation

Driver-monitoring systems (DMS) became mandatory this year in all new vehicle models sold in Europe; DMS inclusion gets points towards a 5-star Euro NCAP rating, and poor DMS safety performance is in American news lately. Clearly, it's a hot topic.

DMS is basically using a camera and sensors to track driver attention level through eye or eyelid movements. As soon as we have a DMS in the vehicle, it opens opportunity for different multimodal Human Machine Interfaces (HMIs) strategies for safer driver driving and personalized comfort and wellness.

DMS can identify the driver and enable personalization to automatically adjust the seat, temperature, side mirror, etc., to the driver's preferences. The systems will be able to identify a driver compromised by impairment, fatigue, or medical emergency. A variety of DMS technology developments and first applications have been reported here in DVN Interior since the beginning.

DMS is also crucial for making the jump to L^3 automated driving ('conditional automation'; the driver can take their hands off the steering wheel, but must keep their attention on the road in case they need to resume control). DMS plays a critical role in making sure the driver is alert and attentive.

This opens new horizons to HMI with more personalization and automated adjustments, allowing the driver to focus on what is important. You'll learn much more in the HMI/Smart Surfaces session of the upcoming DVN Interior Workshop, which is now just *three weeks* away—time to **register**, and take a look at the **docket**. The event will include the results of our newsletter survey; speaking of that, it's time to vote on **question 7**.

Sincerely yours,

Philippe Aumont
DVN-Interior General Editor

In Depth Interior Technology

DMS Mandate Paves Way for New Functions

BOSCH IMAGE

A driver monitoring system (DMS) is designed to monitor the driver's behavior, and alert them if they are showing signs of drowsiness, distraction, or impairment. Cameras and sensors monitor the driver's facial features, eye movements, and head position to determine whether they are alert and focused on the road.

Regulation

The General Safety Regulation (GSR) is the regulation that sets mandatory safety requirements for new passenger cars and light commercial vehicles sold in the European Union—all new models of which, starting with 2024, must have a DMS (Euro NCAP has practically made DMS a requirement for any new car model launched in Europe from January 2023). The intent is to improve safety on the roads and reduce the number of fatalities and injuries resulting from accidents caused by driver inattention. Going further, from July 2024, an interface alcohol interlock systems must be installed in new cars.

Here are the GSR definitions:

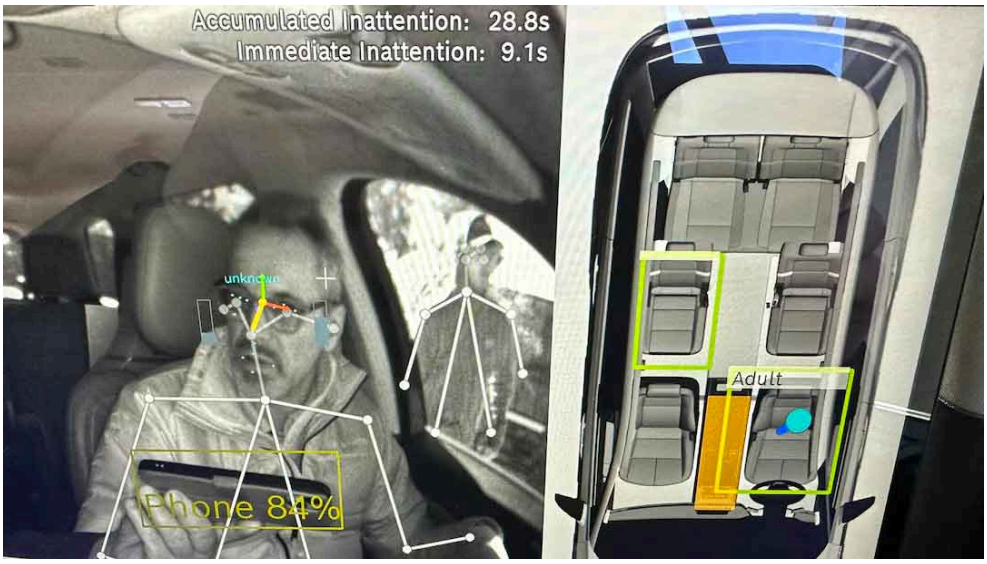
'**Driver drowsiness and attention warning'** means a system that assesses the driver's alertness through vehicle systems analysis and warns the driver if needed;

'Advanced driver distraction warning' means a system that helps the driver to continue to pay attention to the traffic situation and that warns the driver when he or she is distracted;

"Alcohol interlock installation facilitation" means a standardized interface that facilitates the fitting of aftermarket alcohol interlock devices in motor vehicles.

Now, here's an update on the latest developments and challenges:

Bosch

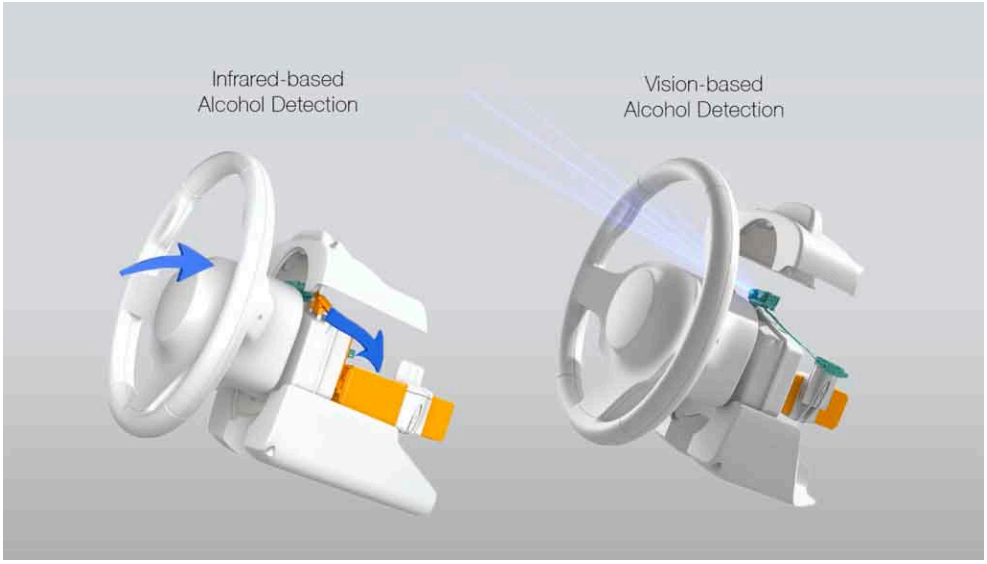


Bosch offers a combination of driver and passenger camera and radar sensor for the interior. The data is combined for evaluation (sensor fusion). The camera is primarily used to test for alcohol—pupil reactions and eye movements are analyzed; they slow down after alcohol consumption, and prolonged staring at one point also indicates alcohol consumption.

Bosch is currently focusing efforts on eye-motion detection, but in collaboration with the University of Berne and Center for Digital Health Interventions at ETH Zurich and the University of St. Gallen, the Bosch IoT Lab is researching other possible methods by which drunk driving might be detected from today's real-time vehicle sensor data streams available on the CAN bus. One current limitation is that obtaining enough eye motion data can take a few minutes, by which time the potentially impaired driver is likely already driving.

As Bosch also manufactures household appliances, they are building a bridge to the home kitchen with their DMS. The Bosch coffee machine is connected to the internet via an IoT interface and thus to the vehicle via the cloud. If the DMS detects fatigue and the driver agrees, the coffee machine is activated so that freshly brewed coffee is ready on arrival.

Magna



MAGNA IMAGE

Magna is using infrared to analyze driver breath. In collaboration with air-and-gas sensor provider Senseair, the breath is analyzed by an infrared sensor on the steering column. The infrared light detects alcohol particles and their concentration in the breath, secured with a camera as a second data source that analyzes pupil movements.

In addition to these safety tasks a camera recognizes whether there is a person or a bag on the passenger seat. This means that the seatbelt warning can be suppressed if there is only luggage there. The camera and

radar provide information about the size and seating position of the occupants. This can be used to improve the algorithms for deploying the airbags. If the front passenger has their feet on the dashboard, the airbag will not deploy in the event of a collision. Or the force is distributed differently depending on the seating position.

The reflection of the waves of a radar sensor makes it possible to analyze breathing frequencies. This makes it possible to determine whether it is an animal or a person. This even works if the dog is lying on the floor of the vehicle or the child is hiding behind the back seat. The user then receives a notification on their smartphone.

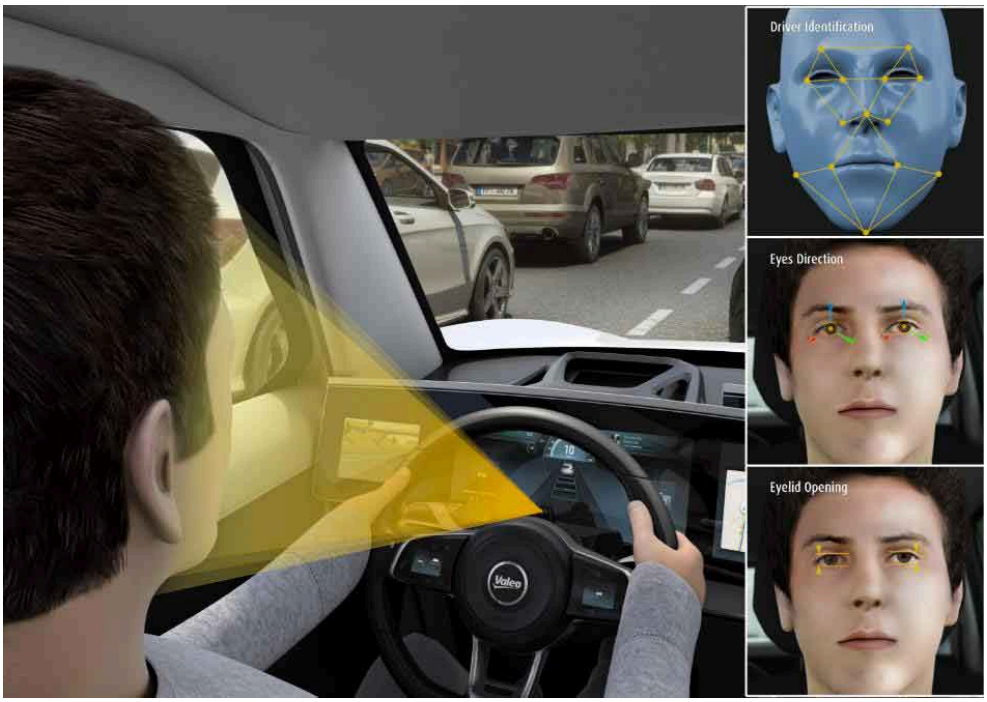
Forvia Hella

SMART EYE IMAGE

Last year, Forvia and Smart Eye were chosen by a global automaker to integrate Forvia's top-tier cameras with Smart Eye's DMS software into upcoming car models. This design win underscores the robustness and innovation of their combined tech offerings demonstrated at CES 2024.

Forvia Hella also offers a child presence detection system, and their Smart Access System uses ultra-wideband technology (UWB) for the locking system and to reject unauthorized entry into the vehicle. UWB is a radio technology like Wifi or Bluetooth. It enables objects to be positioned with centimeter precision. It can therefore also be used to detect the breathing rate of babies or children, as previously reported in DVN Interior.

Valeo



Valeo has been awarded for their 2.5-megapixel interior monitoring system camera. Located in the dome module, this wide field of view camera delivers IR and RGB images enabling occupant monitoring and video streaming /selfies (a great countermeasure for the severe health risks of going more than five nanoseconds without posting to social media!).

Jungo

Israel-based Jungo Connectivity was founded in 2013 as a spinoff from Cisco Systems. Their main product, VuDrive, is a comprehensive accident prevention system designed for fleets, telematics service providers (TSPs), and insurance companies. This camera-based driver monitoring solution involves affordable, easily-installed hardware.

Additional Jungo products include CoDriver, a complete software stack enabling automakers and tier-1s to quickly embed accurate, robust, affordable driver monitoring and passenger sensing capabilities.

Emotion 3D

EMOTION 3D IMAGE

Austria-based Emotion 3D recently published on their blog a paper about DMS and data privacy.

The idea of cameras and sensors tracking driver behavior can make drivers feel surveiled and…well, *monitored*. It's an unpleasant feeling, and it can easily lead to other sticky questions ('I do not ever drink alcohol; I do not and won't ever transport children; why should I have to pay for these intrusive systems?'). Emotion 3D endorses the GSR's principle that driver monitoring systems should operate in a closed loop, not make any data available to third parties at any time, and delete data after processing. Certainly those would be best practices from the standpoint of the end user, but maybe not from the corporate side; can those principles really stand up in the face of the overwhelming urge to monetize?

Emotion 3D says they work hard to address this constellation of concerns. During software development process, they obtain consent from everyone included in our training and validation data sets. This helps gather a diverse range of data, which is crucial to prevent biases regarding ethnicities, gender and age, while protecting the individual's privacy. Moreover, they use synthetic data extensively to reduce the need to record real people and still cover all variabilities that exist in given scenarios resulting in highly effective solutions. Their software complies with local regulations such as GSR in Europe, where their software runs directly in the car without any data leaving the vehicle (very fine for European drivers…what about in America, where there are no data privacy laws?).

Further Challenges

KEY WATCH IMAGE (SEE VIDEO)

While DMS has many benefits, there are also several challenges to implementing it, including:

- Cost: DMS systems can be expensive to install and maintain, making it difficult for some vehicle manufacturers to adopt the technology.
- Driver Acceptance: Some drivers may feel that DMS technology is invasive or unnecessary, and may be reluctant to use it.
- Privacy Concerns: DMS technology can raise privacy concerns, particularly if the technology is used to collect and store sensitive data on drivers. This can be a particularly sensitive issue in countries with strict data privacy laws or where there is a general distrust of technology.
- False Positives: DMS technology can sometimes generate false positives and can lead to unnecessary alerts and can cause drivers to become frustrated with the technology. And that's even without the likes of alcohol interlocks.

Conclusion

The automotive industry is significantly impacted by DMS, affecting both drivers and passengers. Mandated by regulatory bodies, DMS is now an integral part of our daily lives in the coming years, with safety being the main advantage. However, DMS also offers a great deal of other benefits, including enhanced user experience for drivers and passengers. It also poses new threats and challenges to be grappled with.

Transport and logistics represent another industry affected by DMS. In addition to passenger vehicles, regulations extend to commercial vehicles, trucks, and fleets, and taxis, ride-sharing services, delivery companies, healthcare transportation, buses, trains, and trams where mitigating driver impairment is crucial due to longer duration of vehicle operation leading to an increased risk of fatigue and distraction.

Alcohol detection, especially, raises new concerns, as the vehicle gets to decide whether you are allowed to drive. What happens when the system falsely decides a fully sober driver has been drinking and disables the vehicle? It's almost certain to happen, and the result will range from inconvenience to mortal danger, depending on where the driver needs to go, why, and how urgently. or not. Time will tell if it is accepted!

Interior News

Renault's CEA Lattice Structure for Lightweight Comfort

INTERIOR NEWS

Renault Group and CEA, the French national research organization, have created a novel material architecture that combines digital design with additive manufacturing (3D printing). After the bi-directional high-efficiency charger for electric vehicles announced for 2023, it is now the turn of on-board comfort to combine the technical expertise and creativity of the two partners.

After two years' research and testing, and about ten patents filed, they've developed a complex mesh structure. Using a single material, and in a single 3D printing additive manufacturing, the structure produces components with adaptive mechanical behavior and enhanced performance.

More powerful, lighter, and customizable, new created components could replace those usually made up of a combination of several materials, such as seats and backrests, armrests, and center consoles. Although more complex in their design, the resulting monolithic and mono-material parts are simpler to produce, in a single 3D printing operation and without any assembly, minimizing the carbon footprint and generating no scrap.

Made from TPU (thermoplastic polyurethane), these innovative structures are recyclable. Research is continuing to assess the compatibility of other materials, particularly bio-sourced materials.

Applied to seats, for example, this innovation should make it possible, while making them about 30 per cent lighter and thinner, to use a single material to achieve levels of comfort, cushioning and support that cannot be achieved with the usual materials used (fabrics, foams, reinforcements, etc.).

The seat could even be modelled on the morphology of its driver and its different zones configured with specific properties to respond to individualized pressure efforts and thus offer unique levels of comfort and cushioning.

The design is not to be outdone either, with additive 3D-printing also offering a wide choice of shapes, textures, and customization options.

Genesis Neolun Concept Has Central Rollable Display

INTERIOR NEWS

The Genesis Neolun concept is a Kia EV9 in a Genesis suit…until you enter its unique cabin, put together with 'reductive design'. Numerous screens have been cleared away and there is only a single, roll-up display in the dash.

The Neolun name is borrowed from Greek and Latin with “neo” and “luna” respectively. It’s a large electric SUV and eliminates the B-pillars by way of coach doors, but the rest of the Genesis design language remains with its unique lighting treatment that extends into the front cutline of the front doors. There are integrated electric steps to facilitate ingress and egress.

It is a rather spartan interior, with only a few switches on the dash, speaker grilles, and not much else. Most of the controls are made into the oblong steering wheel. There aren’t any vents as the Neolun utilizes radiant heating, inspired by Korean houses with 'ondol' heated floors. Speaking of which, the floors in this Genesis are made of real, dark-colored wood. Wrapping the rest of the interior is cashmere in Royal Indigo while other touch surfaces and seats are wrapped in vintage-inspired leather and dyed Purple Silk to complete the old-school royal color scheme.

Infotainment is centralized, thanks to that large, height-adjustable rollup screen. The crystal sphere at the center of the dashboard rotates to reveal a central tweeter. The rear seats get their own flexible screen that folds down from the headliner. The front seats swivel so front and rear passengers can talk to each other face-to-face.

Ford + Cisco = In-Vehicle Conferencing

INTERIOR NEWS

WEBEX MEETING WHILE PARKED IN LINCOLN NAUTILUS (FORD IMAGE)

Cisco and Ford say the Webex app by Cisco for conferencing and collaboration is now available for download in the all-new Ford and Lincoln Digital Experience. In select vehicles, it will allow working from anywhere, with seamless connectivity and immersive meeting experiences.

Webex is the first to introduce immersive meeting and audio calling in the Ford and Lincoln Digital Experience. Webex and Ford have jointly spearheaded the custom-built solution optimized for the vehicle, transforming it into a true alternative workspace apart from home or the office. It also includes Webex's AI background noise removal and provides an added layer of seamless connectivity because the app is available through the native infotainment experience, allowing Webex customers to work from anywhere without the need for their tablet, smartphone, or laptop.

While on the move, drivers can join audio-only Webex meetings and calls effortlessly from the in-vehicle touchscreen (will the next generation of DMS be able to check if not only the driver's gaze is on the driving task, but also their mind? It may have to!). When the vehicle is parked, the driver can join Webex meetings and view other remote participants' video or shared content, share reactions, view the participant list and more as if they were at their desk in the office or at home.

The Webex app is available to download on Google Play in vehicles equipped with the Ford and Lincoln Digital Experience, including on the Lincoln Nautilus and soon on the Lincoln Aviator and Ford Explorer.

Bentley Batur Features “Light Sculpture” Technology

INTERIOR NEWS

BENTLEY IMAGE

The new Bentley Batur has technology that projects welcome animation sequences onto the ground from the car’s door. The light sculpture feature was first showcased in an illuminated front grille on the 2019 EXP100 GT concept car. Its new implementation showcases the potential of 'light craftsmanship', and its role in 'luxury digital personalization', Bentley syas.

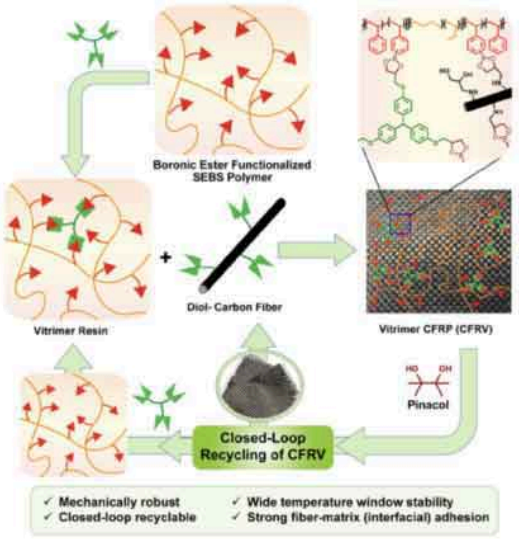
Using advanced digital light processing (DLP), the handcrafted coupe projects an animated welcome image onto the ground when the door is opened. The projection system employs three colored light sources projecting through multiple lenses and prisms into an advanced digital micromirror device (DMD) measuring 8 mm^2.

The device features 415,800 microscopic mirrors that create a moving image by precisely controlling the reflection of light. Each mirror, Bentley says, are only one-fifth the width of a human hair.

The animation is sculpted by directing light through the colored sources and lenses onto the DMD chip. Mirrors in the 'on' position reflect the light to create the image, while those in the 'off' position direct the light away.

Closed-Loop Recycling for Carbon-Fiber Composites

INTERIOR NEWS



DOE ORNL IMAGE

Researchers at the US Department of Energy's Oak Ridge National Laboratory (ORNL) in Tennessee have developed a closed-loop process to create a highly durable carbon fiber reinforced polymer (CFRP) and reclaim all its raw materials afterward.

CFRP is a valuable material for industries as automotive or aerospace, seeking lightweight, strong and tough composites to enhance fuel efficiency and performance. However, traditional CFRPs are challenging to recycle, resulting in significant environmental impact due to their single-use nature.

The ORNL innovation, funded by the DoE's Vehicle Technologies Office, addresses this challenge by introducing a closed-loop technology, detailed in an open-access paper published in Cell Reports Physical Science.

In car interiors, CFRP could apply to seat structures, cockpit cross-car beam, etc.

Once formed, conventional thermoset materials are permanently cross-linked and cannot be reprocessed. In contrast, ORNL's system incorporates dynamic chemical groups into the polymer matrix and its embedded carbon fibers, allowing for multiple reprocessing cycles without compromising mechanical properties such as strength and toughness.

Led by ORNL chemist Tomonori Saito and researcher Anisur Rahman, the team has applied for a patent for the process. They say that by incorporating dynamic covalent bonds, the interface securely locks materials together and can be selectively unlocked using heat or chemistry, enabling efficient recycling without loss of starting materials.

According to the researchers, the technology enables closed-loop recycling at the laboratory scale and offers other features such as quick thermosetting, self-adhesive properties and the ability to repair microcracks within the composite matrix.

The team undertook a detailed characterization of the material, including tensile properties, chemical mapping, rheological analysis and microscopy. Inspired by nature's dynamic interfaces, such as those found in nacre, the researchers aimed to optimize interfacial chemistry between carbon fibers and the polymer matrix to enhance interfacial adhesion and CFRP toughness. The resulting material exhibited tensile strength, which the team claim surpassed that of stainless steel and conventional epoxy-based CFRP composites used in automobiles.

Looking ahead, the researchers aim to extend their studies to glass-fiber composites to further reduce costs across industries, including automotive, aerospace, marine and construction.

Peugeot's E-5008 SUV

INTERIOR NEWS

PEUGEOT IMAGES

Peugeot's got a new large electric SUV, the E-5008, and it's been launched in three versions. It is 4.79L × 1.89W × 1.69H meters, and based on Stellantis' new STLA Medium platform.

The interior of the 7-seater has ambient lighting, genuine aluminum, a large panoramic sunroof, and mottled fabrics. The ambient LED lighting under the screen accentuates a floating effect. **AGR-certified** seats can also be ordered for the driver and front passenger. In the GT version, the front seats are ventilated and massaging and even the seats in the second row can also be heated.

The panoramic display of the Allure trim is made up of two 10" HD screens. The Panorama iCockpit combines the instrument cluster and infotainment touchscreen in a curved, 21" HD display and comes as standard in the GT trim. This large digital panel of exceptional quality combines two key functions of the Peugeot i-Cockpit:
To the left, above the compact almost-hexagonal steering wheel, the display collects all the driving information: speed, power meter, driving aids, energy flow, etc. To the right, in the center of the dashboard, the touchscreen is accessible to both the driver and passenger. It controls the heating and air conditioning, navigation, media, and connectivity systems, etc.
In addition to 10 programmable buttons (iToggles), the infotainment system offers wireless Apple CarPlay and Android Auto and, in the higher version, a TomTom navigation system. This allows you to use the trip planner, EV routing and the E-Routes app. Updates are carried out over the air, and ChatGPT is also on board.
The E-5008 will be launched this fall in the Allure and GT equipment versions, and with three option packages.

The Design Lounge

Brazil

THE DESIGN LOUNGE

MESSERSCHMITT KR200 CABIN SCOOTER COCKPIT, 1955 (WIKIMEDIA IMAGE)

Cruising in tandem inside a glass canopy, holding on a swiveling bar, with two cantilevered wheels in the front and one in the rear, slowly accelerating on the tarmac, is a beautiful and picturesque mobile sensation, related to the magic moment just before taking off. But what if it didn't take off and that moment lasted…

Aviation and automobile have crossed paths all along their legacy, extracting storylines from one another and exchanging narratives, dreams of speed and freedom, adventures, but also technology, business cases and in times even parts. Spitfire (Triumph), Mustang (Ford), Starfire (Oldsmobile), Firebird (GM) and a few more, were car design programs that, at some point, for some reason, someone had an idea and decided to associate them to an aviation legend. Their car character was not altered, furthermore they endorsed an exotic flair to their "automotiveness". While show-cars expressed the form, and production cars carried the name, very few combined both and went as far into the aviation idea of driving on tarmac.

Indeed, a very curious relic of car history went over all prospects, shifting the balance clearly more towards piloting than driving. It is entirely based on a design composition that aimed to solve a practical problem back then, postwar, in Europe: cheap and accessible mobility. It has achieved though something different in the

imaginary of all the creatives, resulting into an anachronistic vehicle design. Like a vision of what the 1980s might have looked as viewed from the perspective of a 1940s designer. Its originality will always remain a reference.

Three kick-scooter-size wheels transport essentially a cockpit with mudguards, the FMR KR 200, with one of wheels attached by chain to a 10hp, single cylinder, 191cc Fichtel & Sachs two-stroke engine. Yes, you'd have to prepare your own fuel-mix before you start. Reminiscent of its aircraft roots, its low center of gravity, low weight, tandem seating, narrow body, low frontal area, and centralized mass, made it an ideal vehicle for handling and riding, responsive at the tiniest movement. Like a motorcycle looking for its waterproof version, the odd three-wheeled bubble-car features a unique - more akin to what you'd find in an aircraft cockpit - swiveling bar instead of a conventional steering wheel. It does and doesn't have reverse: by switching off the engine and turning the key the opposite way, you restart in reverse (!) with the four gears going backwards.

Its comprehensive instrumentation features a voltmeter and a very optimistic speedometer indicating 80 top speed. It is claimed that you could fit a third person, depending on their size. The cabin is surrounded by transparent surfaces with a great 360 view. Sitting essentially under a glass bubble, if you don't get a sunburn, you become deaf, however, the export package included a sunshade, a fully trimmed interior and a clock.

This automotive morphology never took off no matter the numerous miles driven on tarmac; nonetheless, it acknowledged a different depiction of mobility. If design is not about the object but rather the context, a situation, or feelings, today the specific vehicle is not considered as a car, but as many of its collectors confirm, it is a social hobby. It might be that rather than just a curious or inspiring hint on new micro vehicles, it expresses a wider narrative of personal transportation.

The specific vehicle has been dubbed by a filmmaker as a central piece of one of the masterpieces of cinematic action. In the movie Brazil, it plays a memorable role as Sam Lowry's personal transporter. The film is set in a dystopian world in which there is an over-reliance on poorly maintained and rather whimsical, machines, and it has been hailed as an inspiration for writers and artists since.

Obvious reactions would suggest: but how this car would compare itself in today's standards, being small, compact, narrow, and very fuel efficient? Its reduced footprint in combination with its autonomy might have been revelatory next to contemporary electric micro vehicles. Indeed, conceived by an automotive outsider, such as an aviation specialist, it turned out to be beneficial to the automobile sector, before compact cars became widely acceptable, such as the Mini.

Perhaps it is not at all about that. Movie director Terry Gilliam depicted the specific – otherwise very difficult to film due to its tall and narrow proportions - vehicle for very good reasons. Its emblematic presence alludes into a different dimension of mobility, a bit like flying, going away, taking the freedom to drive anywhere, within and throughout the very defining city-structure, rendering permeable even the most dense and rigid urban set-up.

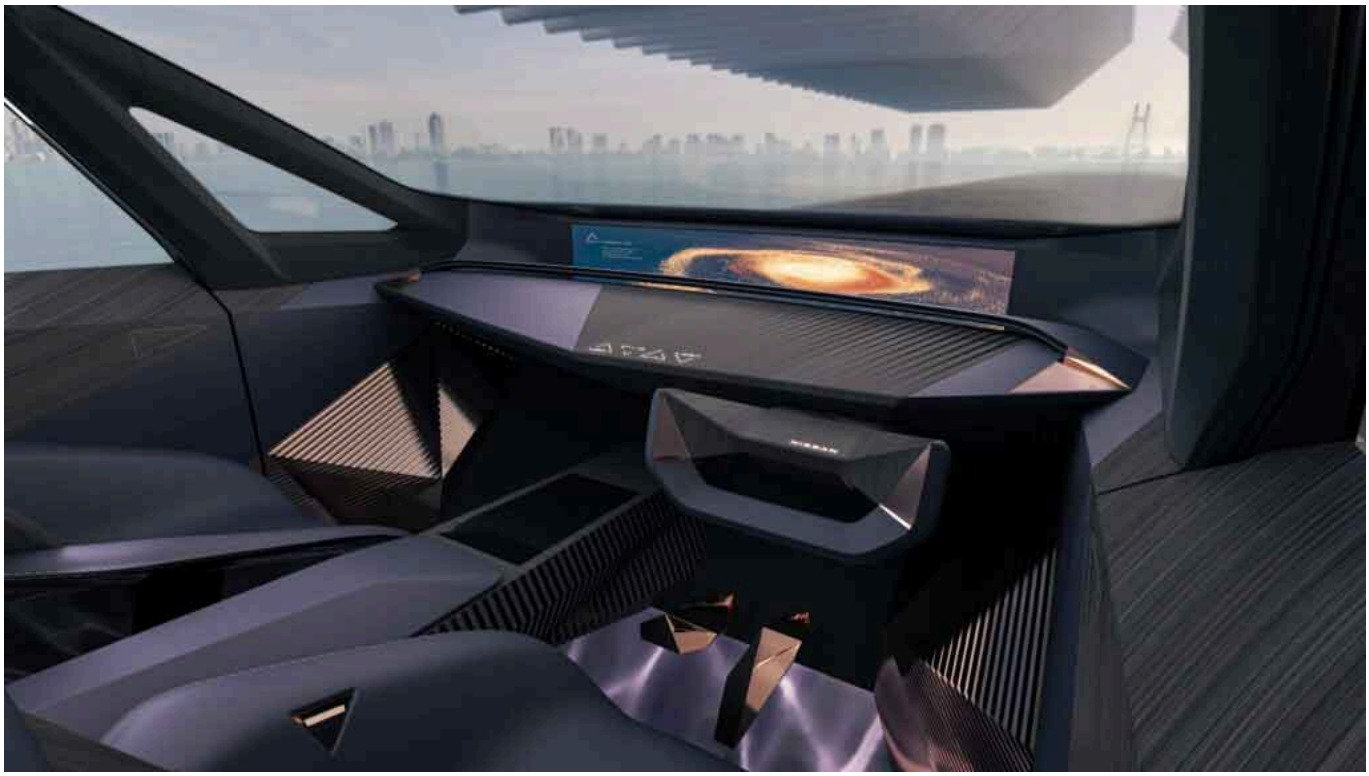
As referenced*: *'The lighting and set design was coupled with Gilliam's trademark obsession for very wide lenses and tilted camera angles; going unusually wide for an audience used to mainstream Hollywood productions. Gilliam made the film's wide-angle shots with 14mm (Zeiss), 11mm and 9.8mm (Kinoptik) lenses, the latter being a recent technological innovation at the time as one of the first lenses of that short a focal length that did not fish-eye. In fact, over the years, the 14mm lens has become informally known as 'the Gilliam' among film makers due to the director's frequent use of it since Brazil.'*

Gilliam's trademark obsession with wide angle lenses contributed indirectly to the way car design would look through a screen. Already since the late 80s, car sketches and renderings, with markers and chalk on velum paper, would express multiple wide-angle perspectives and previously unusual tip-up views, indicating surrounding reflections and background context, while in the 90s the wide angle approach in sketching was replicated to its digital version. The 'Gilliam' was indeed great for cars but also when extra width was needed to capture the bigger-picture within a car design rendering.

Visual aesthetics, symbolism, contrast, and juxtaposition, and without a doubt, memorability, are the ingredients that a movie director, as well as any car design, are measured against. Therefore, it is all about a targeted contextual awareness. In other words, what would be the ideal context for today's vehicles? Or, for today's context, what would the ideal vehicle be?

Nissan's Hyper Tourer EV Concept

THE DESIGN LOUNGE



NISSAN IMAGES

The Nissan Hyper Tourer is an autonomous electric minivan, the third Nissan EV concept. It focuses on nurturing and reinforcing the bonds among people as they journey together. Designed with a focus on revolutionizing electric minivans, its V2X functionality means the vehicle can be charged in most scenarios.

The interior contains a spacious interior and compactly-arranged components. Traditional Japanese kumiko and koushi patterns decorate the overhead console and lighting, creating an atmosphere of luxury. An LED panel integrated into the floor showcases imagery of a riverbed and the open sky.

The seats can swivel 360°, facilitating face-to-face interactions among front and rear passengers. Rear-seat occupants can access and control navigation and audio through a wearable display, fostering a sense of togetherness among passengers.

Its AI system monitors occupants' biometric data, including brain waves, heart rate, breathing and perspiration, and is able to adapt music and lighting to suit their mood and preferences.

Nissan's advanced 'e-4ORCE' technology and the vehicle's ultra-low center of gravity evoke speed, comfort, and smooth driving.

News Mobility

VW, Mobileye Strengthen Autonomous-Assistance Pact

NEWS MOBILITY

VW IMAGE

The Volkswagen Group is intensifying their cooperation with Mobileye; the two companies want to bring new automated driving functions into series production.

According to a press release, Mobileye will provide technologies for partially and highly automated driving based on their SuperVision and Chauffeur platforms. VW Group brands including Audi, Bentley, Lamborghini, and Porsche want to use this technology to quickly introduce new driving functions with all drive types. These include assistance systems for highway and city traffic, including autonomous overtaking in permitted areas of multi-lane roads, automatic stopping at red lights and stop signs, as well as assistance at junctions and traffic circles.

Mobileye is to supply further technology components for autonomous driving for Volkswagen Commercial Vehicles. According to the press release, Volkswagen is focusing on its own complete system in the long term: the partnerships with Bosch and Qualcomm and with Horizon Robotics in China will be continued in a focused manner. And all driver assistance systems will be based on the software architectures developed by the VW subsidiary Cariad.

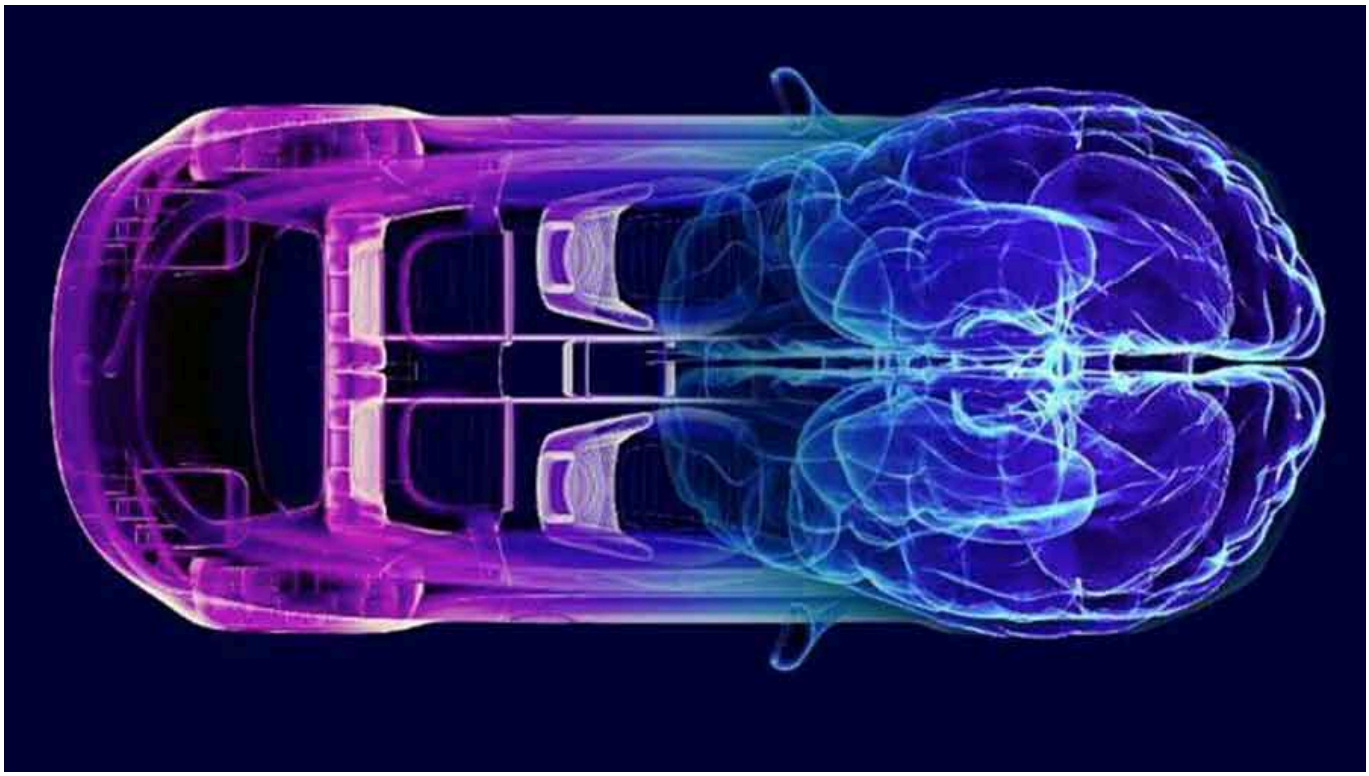
To achieve L^4 functions, the Volkswagen Commercial Vehicles brand will eventually be supplied with software and hardware from Mobileye. Following an extensive pilot phase with road tests in Germany and the USA, the VW Group company Volkswagen ADMT has concluded a cooperation agreement with Mobileye.

According to the press release, the core of the agreement is the use of a self-driving system for a special version of the ID.Buzz, which has been under development for autonomous driving since 2021. The system is capable of providing L^4 autonomous driving, and is based on various software and hardware components, including two independent high-performance computers as well as 13 cameras, nine lidar and five radar units. Each of these sensor networks can provide 360-degree coverage of the surrounding area. The autonomous vehicles are always online for safe and efficient control.

The development goal of Volkswagen ADMT is to be able to offer the fully electric autonomous ID.Buzz AD mobility and transportation services from 2026.

New AI System for Unexpected Driving Scenarios

NEWS MOBILITY



AUTOBRAINS IMAGE

The startup Autobrains has announced 'Liquid AI', which they say is more efficient than conventional AI. It combines a self-learning approach with a modular and adaptive architecture with specialized scenario-based end-to-end networks.

Developers of assistance systems and autonomous driving functions could use this approach to handle unexpected driving scenarios (edge cases or corner cases). Current technology lacks the precision required for such tasks, says Autobrains founder and CEO Igal Raichelgauz.

Today's AI systems have to be trained for all possible driving scenarios and their special cases, the report continues. This is done by manually marking images. This increases the demand for energy and computing power. According to Autobrains, 10,000 times more computing resources are required to improve system accuracy by a factor of 10.

The company describes their concept as a network of specialized AIs: hundreds of thousands of such AI systems each take on a specific task. This enables precise reactions tailored to the respective driving scenario. The architecture of the AI systems adapts as required. Only the areas whose function is required for the driving task at that moment are activated. This reduces the workload of the system-on-chip hardware.

Autobrains was founded in Israel in 2019, and is based in Tel Aviv. The company is supported by BMW, Continental, and Knorr-Bremse, among others; Toyota and Vinfast are also named as financiers.

General News

Mercedes X-Rays Side Crash Test

GENERAL NEWS

Together with the Fraunhofer Institute for High-Speed Dynamics, the Ernst Mach Institute (EMI) in Freiburg, Mercedes-Benz has carried out the world's first X-ray crash with a real car. Two dummies with female anatomy were on board on the left side facing the side impact.

This proof-of-concept at the EMI research crash facility near Freiburg, Germany has shown that short-term X-ray technology can be used to visualize highly dynamic internal deformation processes. Previously invisible deformations and their exact processes become transparent in this way. The numerous high-resolution images allow precise analysis.

For several years, the Mercedes-Benz vehicle safety department has been working with colleagues at EMI on the use of X-ray technology in crash tests. The decisive factor in the breakthrough was the use of a linear accelerator with 1 kHz technology as the radiation source. The device is far more powerful than the X-ray flashes previously used in experiments: the photon energy of the linear accelerator is up to nine megaelectron volts. This means that all materials commonly used in vehicle construction can be X-rayed.

The duration of the X-ray pulse is only a few microseconds. This makes it possible to record deformation processes in the crash test without motion blur. In addition, the linear accelerator generates a continuous stream of these X-ray pulses. As a result, up to 1,000 images per second are possible. That is around 1,000 times as many as with conventional X-ray methods.

During the crash test, the beams illuminate the bodywork and any dummies from above. An X-ray detector is located under the test vehicle. It serves as a digital image receiver in the X-ray system: when the radiation hits the detector, an electrical signal is generated.

During the actual impact time of one tenth of a second, the X-ray system shoots around 100 still images. Combined into a video, they provide highly exciting insights into what happens inside safety-relevant components and in the dummy's body during the crash.

In this way, it is possible to observe in detail how the dummy's thorax is crushed or how a component is deformed. Important on the way from research to industrial use: the X-ray crash does not affect any other analysis tools. The interior cameras of the crash test vehicle also record undisturbed. Given that a crashing car's structure has about 0.1 second to protect its human occupants, this new granularity should unlock great new insights.

Plastic Omnium Is Now OP Mobility

GENERAL NEWS

Plastic Omnium, the French supplier of body cladding, front-end modules, lighting, and hydrogen components, are changing their name to OPMobility to better reflect their expanding reach. The name change reflects a shift from mainly plastic products to new business areas including lighting and software, OPM say.

Company Chair Laurent Burelle says, "The group has undergone a deep transformation, expanding its activities worldwide and diversifying its customer base, including newcomers in electric mobility. With this new name, we are addressing all the players in sustainable mobility".

OPM are the 20th-largest automotive supplier in Europe. In 2023 they had revenue of €11.4bn and a global network of 40,300 employees; 152 plants, and 40 R&D centres.