Thu, 6 October 2022
Weekly Newsletter

DVN-I
Automotive Interior

NEWSLETTER #130

Editorial

Interior Lighting Enhances Travel Experience And Safety

FORVIA IMAGE

Interior lighting enhances the travel experience; facilitates finding and operating vehicle controls; supports infotainment, and visually improves surfaces and materials. With intelligence, it may even adapt to context and mood. DVN and DVN Interior have not stopped shouting about its importance, and have no plans to stop. The recent very successful Shanghai DVN Lighting Workshop confirmed it again, and this week's in-depth presents the full content of the Smart Interior Lighting session. Interior lighting is very much a part of the increasingly demonstrable quip that in the automotive world, lighting is the new chrome. We all understand that with today's technology, it is much more than a decorative element; it doesn't only beautify surface materials—it is a real chain link of the HMI, of the safety concept, and now even the health and wellbeing solution.

Do enjoy this week's China Workshop report. In the meantime, we proudly present this, the 130th DVN Interior Newsletter! We're ever so glad you're with us.

Sincerely yours,

Philippe Aumont
General Editor, DVN-Interior

In Depth Interior Technology

Smart Interior Lighting at DVN Shanghai Workshop

SMART INTERIOR LIGHTING Q&A SESSION (DVN IMAGE)

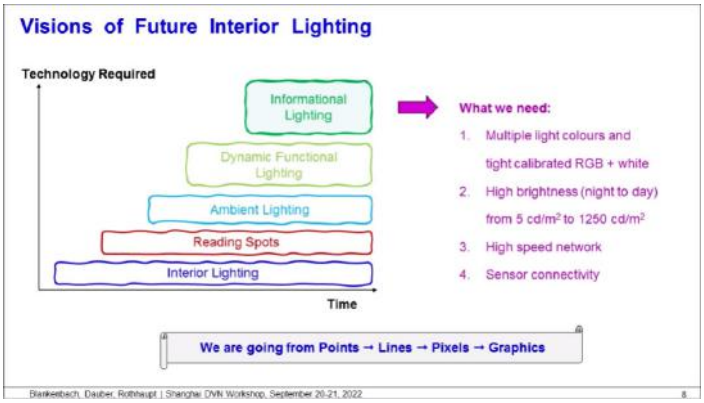
The second session of the DVN Lighting Workshop in Shanghai was focused on interior lighting. 250 people attended the workshop on site, and non-Chinese were included through online video. Three lectures were included, followed by a lively Q&A session.

Interior lighting is not just what one sees when sitting in the vehicle. Interior lighting enhances the travel experience; facilitates finding and operating vehicle controls; supports infotainment, and visually improves surfaces and materials. In this context, intelligence means adapting to context and mood. Lighting is increasingly a pillar of interaction between the vehicle and the driver, an integral part of the vehicle's safety system. And UV light can protect vehicle occupants by dint of air and surface sanitization.

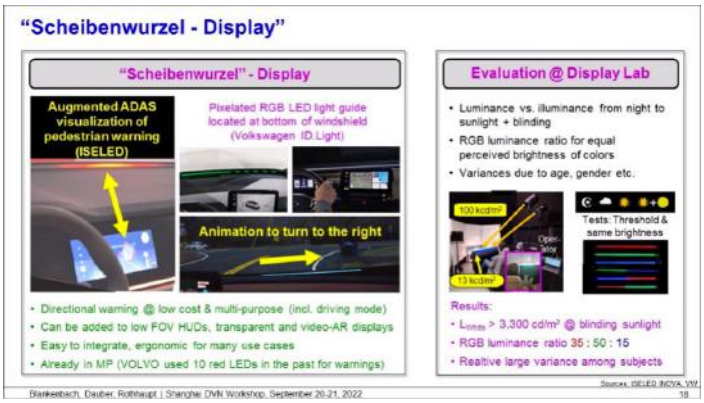
Advances in Interior Lighting
(Prof. Karlheinz Blankenbach, Pforzheim University; Thomas Rothlaupt, Director at Inova; Markus Daubner, Technical Director at Grupo Antolin)

With new interior lighting applications, luminance needs change completely in scale: ambient edge lighting was at the level of 5 cd/m^2; direct pixilated light was around 15 cd/m^2, and pixelated light to work directly in sunlight context with safety application will need around 1250 cd/m^2!

Going from ambient lighting, to dynamic functional lighting to informational lighting needs multiple light colors with tight calibration, high brightness up to 1250 cd/m^2, a high speed/ high-capacity network behind to support.



We'll have much more LED because of all the new application and features. Overall target is to get to new user experience through theater like effects. UX is becoming a very strong signature of the brand, and interior lighting is part of it. As already reflected through new vehicle introduction, there's a stronger automaker effort for the premium vehicles.



From a technical standpoint, there's a need for new lighting performance, and it confirms the need for a new level of network (such as ISELED/ILaS) to support more demanding applications, with higher luminance, light homogeneity, uniformity. The future will go in direction of safety, with more applications in that field (alerts). It will also use light for communication to infrastructure. The claim, no longer new, remains increasingly valid: light is the new chrome.

Ambient Lighting goes Functional
(Linhong Song, embedded lighting field application engineer at Melexis)

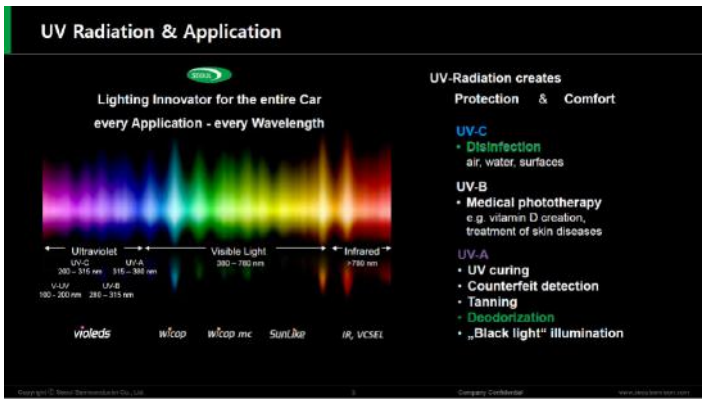
New lighting applications, interior and exterior, all LED based, require smart intelligent LED drivers with diagnosis. For interior, it could be ambient lighting, overhead light, trim lighting, and smart animated lighting.

LIN architecture supports static, dynamic and animated lighting, when system has less than 120 RGB LEDs. With up to 1,180 RGB LEDs, multiple LIN buses is possible, even if support is complex and changes are difficult. One high-end LIN bus based on Gateway architecture is possible.

For high dynamic and high-speed RGB applications, there's a need to increase the data transfer rate, with larger frame/message sizes between ECUs. Combination of LIN Bus and CAN FED is what Melexis has developed with MeLiBu (Melexis Light Bus). It is a high-speed, low-BOM, robust automotive communication system that enables applications with high RGB LED counts for animated light animations within cars—**see additional DVN coverage.**

Melexis' architecture is scalable, with potential mix of MeLiBu, LIN, CAN FD, and Ethernet System. These architectures are robust, leveraging the Melexis portfolio of multi-channel RGB drivers.

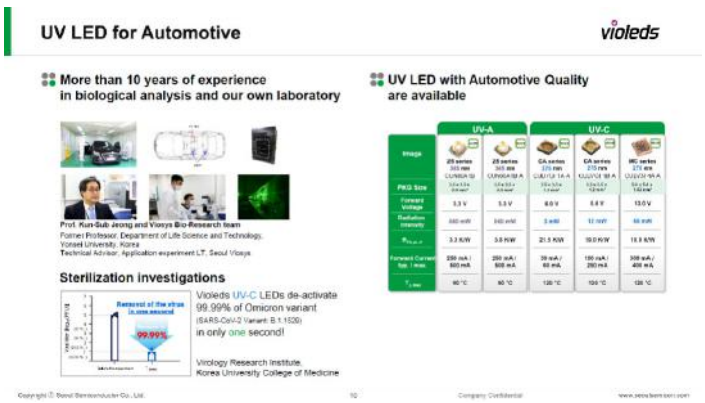
LED Solution for Human Health
(Guanghui YU, VP of Sales at Seoul Semiconductor)



The Covid pandemic has created new expectations in vehicle interiors, starting with shared transport, but now expected in any vehicles. Interior air quality is not a topic which popped up with Covid; it's been on the list since the introduction of plastics in the industry in the 1950s.

Since then, the industry has significantly reduced VOCs (volatile organic compounds)—most of them are emitted to the atmosphere from plastic, post polymerization. It was the typical smell associated with new vehicles.

Interior lighting increases the illumination quality of materials and textures, and also of the skin of passengers. And it can improve the health and wellbeing of the occupants. Violeds is a technology from Seoul Semiconductor, used also in consumer products and home appliances. It can provide UV-A for deodorization and black light illumination; UV-B for medical phototherapy, and UV-C for surface and air disinfection, it has the power to break DNA radical chains.



Tests made at Seoul Semiconductor show that efficiency levers come from wavelength and radiation power. It has a contaminant-removal time just 20 per cent of that required by an ionizer. SpecificallyVioleds UV-C LEDs deactivate 99.99 per cent of Covid (Omicron variant) in one second.

UV Light technology is ready for automotive interiors, for disinfection of air and surfaces, and for elimination of bad odors and VOCs, annoying factor in comfort evaluation.

The smart interior lighting Q&A closed the session with a fruitful dialog between the DVN China workshop on site and the remote European speakers. First questions were addressing the UV Light applications in the vehicle for health and wellbeing. That's probably the less obvious application of interior lighting, which, now after Covid, has very favorable winds for fast implementation.

Furthermore, questions were focused around the need for a stronger light source and electronic network, able to support new applications, including scenarios of rapid light intensity change between a sunny road and a tunnel.

Interior News

Woodbridge's CO2-Neutral Seat Foam

INTERIOR NEWS

WOODBRIDGE IMAGE

Woodbridge, headquartered in Mississauga, Ontario, Canada, provides a variety of interior system solutions that balance comfort, lightweighting, and design, such as seat foam pads and accessories, acoustical foam, headliners, parcel shelf etc.

Woodbridge was recognized as a 2022 Automotive News PACEpilot Innovation to Watch for its CO_2 neutral automotive seat foam, TrimVisible™ Bio. The sustainable foam displaces petroleum-based materials in polyurethane seating foam to produce net CO_2 zero foam and reduce Woodbridge's overall CO_2 footprint.

"Woodbridge is honored to be acknowledged by Automotive News," said Scott Borovich, senior vice president, customer & product experience. "TrimVisible Bio is a game-changing solution that is poised to transform the future of automotive interiors by blending science, technology and sustainability to support our customers in reaching their supply chain carbon neutrality goals."

Woodbridge partnered with a certified sustainable managed forest and developed a proprietary process to convert residue from lumber processing into a high-purity form of biocarbon. After a lifetime of net CO_2 absorption, dead or decaying trees and forest waste are normally a source of CO_2 and methane emissions through decomposition or combustion as part of the biocarbon lifecycle. The Woodbridge process sequesters the biocarbon by effectively locking CO_2 in a form that can be used to engineer solutions that significantly reduce the CO_2 footprint of products. Woodbridge scientists have formulated chemistry to displace conventional urethane chemicals with biocarbon to manufacture TrimVisible™ BIO, a patent-pending technology that offsets the company's Scope 1 CO_2 manufacturing emissions to net zero.

Volvo EX90 Keeps Eye On Driver

INTERIOR NEWS

VOLVO RECHARGE CONCEPT, 2021 (VOLVO IMAGES)

With an L^3 driver-assist system on the way, Volvo works to advance safety with previously unavailable technology; the Volvo EX90 will feature advanced driver monitoring systems that will analyze driver attention and notify the driver if needed.

Volvo's EX90, scheduled to be revealed on 9 November ahead of its market launch next year, will seek to raise the bar when it comes to Driver Attention Monitoring Systems, and not just because its Ride Pilot will be an L^3 system that allow drivers to take their eyes off the road. For all those times when Ride Pilot will not be in use, driver attention is still crucial.

"It's a car designed to understand you and its surroundings to help keep you, your loved ones and others in traffic safe. It can also get smarter and safer over time, as it learns from new data and receives updates," the automaker says.

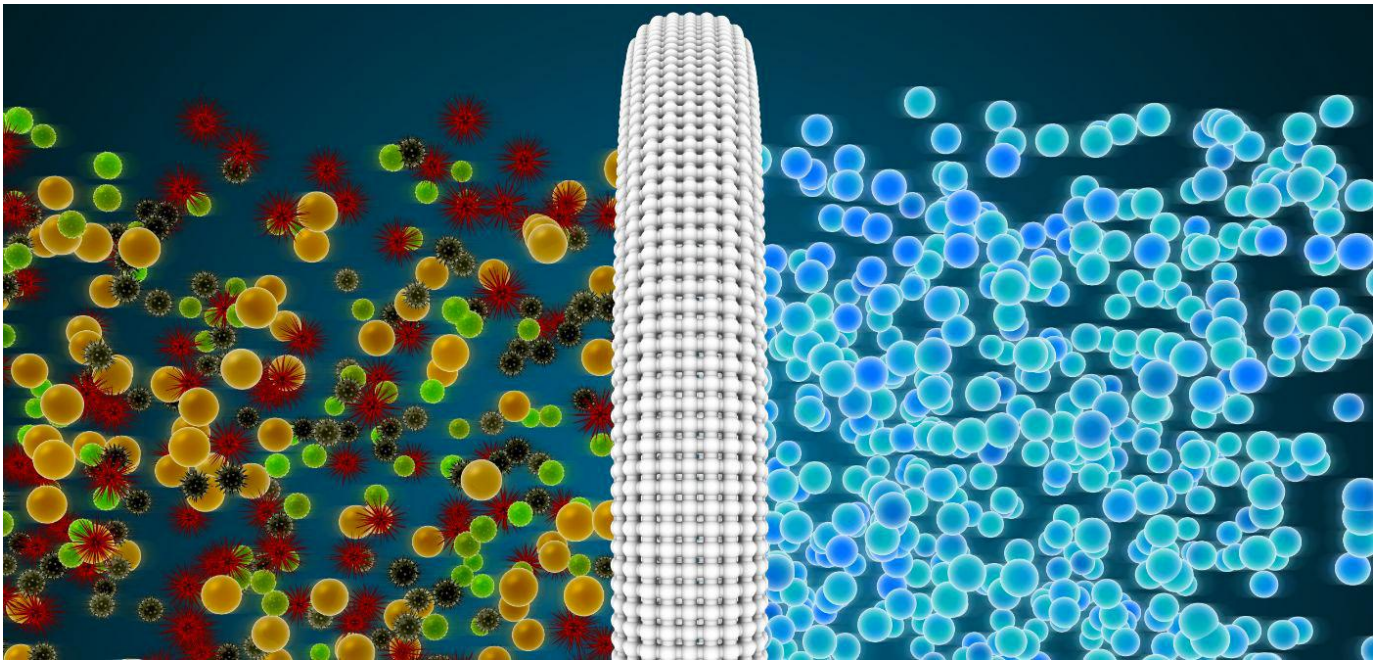
The EX90, previewed by the 2021 Recharge concept (DVN coverage **here**) will feature cameras and sensors with Volvo-developed algorithms that will track driver concentration and eye gaze, with the system noticing if the driver becomes tired, distracted, or inattentive. The system will first alert the driver with a soft nudge, and if needed will take other steps to alert them. Even if the driver falls asleep or becomes ill, the system will be able to safely slow the car down and call for help.

The Driver Attention Monitoring System will also be a part of Ride Pilot, which will be an L^3 driver-assist system allowing drivers to take their eyes off the road and hands off the steering wheel for prolonged periods, when road conditions allow it. And that's the main difference between levels 2 and 3: L^3 permits the driver to divert their attention from the road completely, short of going to sleep, but must still be ready to reassume control within a certain span of time when the system requests it.

The software for Ride Pilot was created by autonomous developer Zenseact along with developers from Luminar, as well as Volvo's in-house engineers.

Tuga, Rensair Partner for Ultra Clean Cabin Air

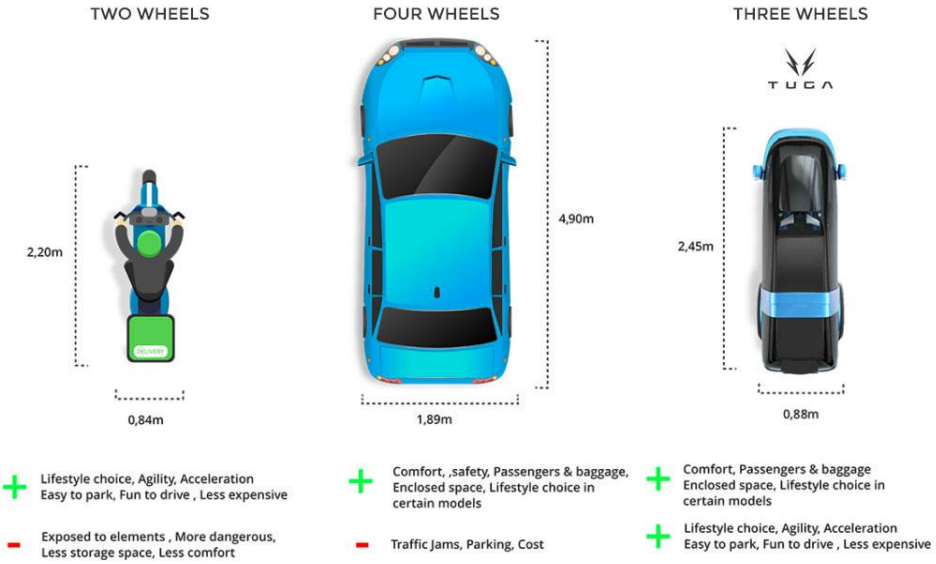
INTERIOR NEWS



TUGA IMAGES

Tuga Innovations is a development-stage EV company undertaking the conception, design, and production of specialized EVs to improve the urban mobility experience. The Company is looking to reduce urban mobility difficulties by developing a family of three-wheeled, fully electric fore-and-aft 2- seat vehicles.

The vehicle is no wider than a motorcycle—for agility—and offers a patent-pending expanding rear axle for high-speed stability along with a patent pending expandable chassis designed for passenger comfort. The vehicle will offer advanced connectivity technology to maximize safety, performance, environmental impact, comfort, maintenance, and navigation.



The Tuga vehicle is being designed to deliver an estimated 160 km range, have an estimated top speed of 140km/hour with the comfort of a car, and with more protection than a motorcycle in an interchangeable multi-body, multi-function platform.

Tuga has entered a non-binding letter of intent with air purification company Rensair for a potential commercial relationship to integrate air quality technology into new Tuga EV.

Headquartered in London, Rensair specializes in the combination of high-efficiency particulate air and ultraviolet C technology for a range of sectors including in automotive.

If a collaboration between Tuga Innovations and Rensair comes to fruition, then the clean air specialist will develop an environmental control unit for the Tuga EV to purify, clean and monitor air quality inside the cabin. The system will also be capable of filtering and destroying pathogens and organic compounds like Covid-19.

If Rensair technology is introduced, unusually clean air will be available for Tuga drivers and passengers. Benefits include air quality controls inside the EV which will help to provide information on exterior conditions, in addition to providing a healthier way to travel in congested urban areas.

Software-Enabled Sensing Surface Technology from TGo

INTERIOR NEWS

TGO IMAGE

At the 2022 Detroit auto show, TGo showed their patented software-enabled sensing surface technology. Designed for applications within the automotive industry, the company's software-enabled sensing surface technology can turn everyday conductive polymer materials into touch and pressure-sensitive surfaces inside and outside of vehicles.

TGo brings intuitive touch to products to make every interaction a tactile experience. Their target is to redefining the future of touch-based HMI for more human, more intuitive and more immersive experiences. TGo was founded in 2015, and is based in London, England.

Visitors were able to interact with the company's demonstrator setup, to better understand what the touch sensing technologies can do in real-world applications. The demo consisted of the following eight areas:

- touch and pressure-sensitive button with integrated LED
- multislide: textured 10-finger multitouch sliding bar with LED illumination
- smart key: push button with up/down/left/right navigation
- precision dial: seamless rotary dial with push/pull/rotate/tile motion controls
- spin donut: ergonomic radial slider centered around a through-hole
- soft touchpad: deformable trackpad with localized pressure detection
- push/pull tab: seamless 3-level push and pull control
- twist control: 3D high-precision deformation control

Lexus RX : Cocoon-Interior, Tazuma Cockpit

INTERIOR NEWS

LEXUS IMAGES

The new Lexus RX is planned to be launched in in Europe in early 2023. It’s a spacious SUV with kind of premium furnishings, a mix of surfaces that are pleasant to the touch, high-quality materials, with special attention to interior noise insulation. The comfortably tuned chassis emphasize the cozy cocoon effect.

The front seats have been redesigned to improve accessibility, support and heating/ventilation. To provide proper ergonomic support around the waist, a concave shape was created in the seat sides. It has an animal-free leather interior, created in response to growing demand from vegan and other eco-conscious consumers. Seats, steering wheel and shifter-knob are covered with synthetic leather.

The 14” widescreen of the infotainment system has a classy-looking glass surface, high-resolution graphics and fast response times. In addition to a powerful computing brain, the multimedia technology offers the connectivity helpers Apple Carplay and Android Auto. Using smartphone, navigation, vehicle commands, multimedia functions and cloud connectivity, there are many ways for the driver to interact with the new RX.

The on-board electronics handle OTA (over-the-air updates), and the "Hey Lexus" voice assistant and "Lexus Link" smartphone app are also available. The latter allows the user to lock and unlock the vehicle via cell phone or to determine its location. The new e-latch system electronically controls the door operation, making them smoother and easy-to-use. Alongside the standard embedded navigation system, the RX provides cloud services as standard (in markets where the service is available). The car's DCM (data communication module) provides always-on connectivity, providing live information on traffic events, accidents and road conditions.

To make the cabin more driver-centric, Lexus developed the “Tazuna” cockpit concept. Taking its name from a Japanese word describing a rider’s control of their horse using the reins, Tazuna focuses on giving the driver direct, intuitive control of the vehicle, following the principle of “hands on the wheel, eyes on the road.” Direct control means direct access to information sources like the multimedia screen, HUD, multi-information display, single-dial meter, centralized gages, are grouped so their content can be read with minimal eye and head movement.

Next-Gen Mustang Has Driver-Focused Digital Cockpit

INTERIOR NEWS

FORD IMAGES VIA NETCARSHOW

For the new Mustang interior, Ford installed a glass-clad open center stack to create a driver-centric cockpit. Behind the driver's flat-bottom steering wheel is a 12.4" digital instrument cluster which can be customized to show a range of vehicle details depending on the selected drive mode. When choosing a drive mode, a visualization of the vehicle setup is visible on the center stack powered by the Unreal Engine 3D software. The Mustang's settings can then be changed by swiping and interacting with the virtual model.

Adjacent to the driver's instrument cluster sits a newly developed 13.2" SYNC 4 center stack. Ergonomically positioned to face the driver, the screen benefits from easily accessible controls. The SYNC 4 system is compatible with Apple CarPlay and Android Auto, and enables integration with the FordPass app. Occupants can stay connected with the car, using free remote features such as remote vehicle start and stop, door locking and unlocking, scheduling a start time, locating the vehicle, and vehicle health and status checks. Additionally, the system can be updated using Ford's Power-Up wireless update technology.

The interior features a new grain pattern, leather seats and soft-touch plastics for the instrument panel and doors. The steering wheel is also completely covered in leather, with higher trim models benefitting from a choice of different color stitching on the wheel, center console and seatbelts. USB ports have been placed behind the steering wheel to enable the installation of track camera devices without wires hanging around in the cabin.

Sound is delivered through a 12-speaker Bang & Olufsen system complete with an additional subwoofer, and ambient interior lighting can also be configured to an individual's requirements. Amazon Alexa Built-In with Ford Streaming allows music and podcasts to be played with simple voice commands.

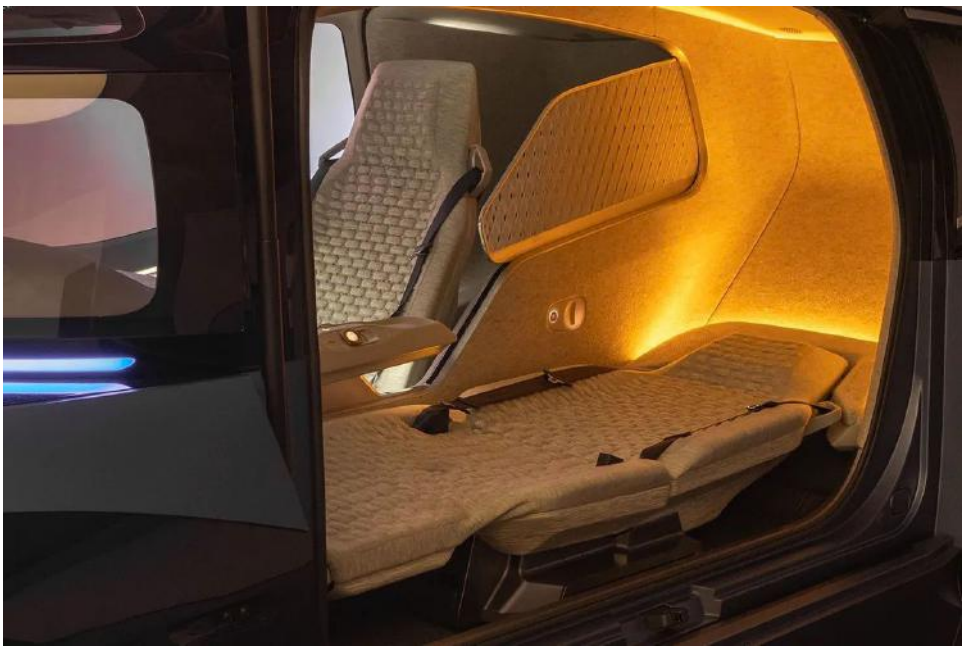
The Design Lounge

VW Gen Travel Concept

THE DESIGN LOUNGE

VW IMAGES

At the Chantilly Arts & Elegance show near Paris, France, VW introduced an electric vanlike concept car that features *L*[5] autonomous technology and a remarkably reconfigurable interior, including seats transforming into beds, like an aircraft's business class.

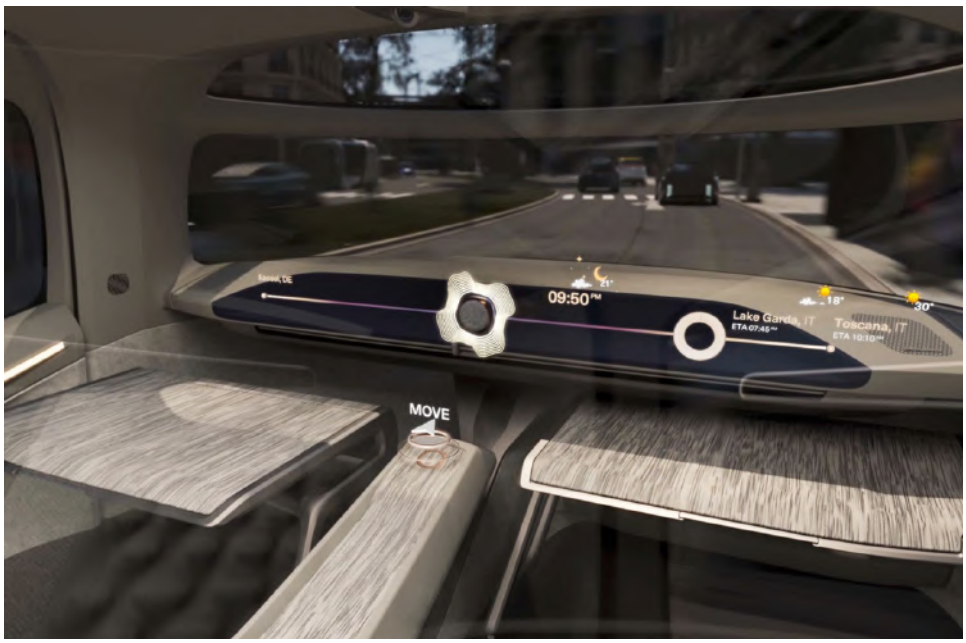


The 'overnight' setup is only one of the many ways the Gen Travel's seating can be repositioned. There's also a 'conference' setup with four seats and a large table in the middle, while dynamic lighting is designed to create a pleasant working environment and to mitigate kinetosis or motion sickness.

Additionally, the seats can recline in all sorts of ways, and there appear to be tray tables that extend from the dashboard. Augmented reality displays can even project various images designed to entertain kids (or adults).

The upright, glass-heavy cabin should let in a lot of light, and VW stated the bottom of the side windows sits at waist level, giving you a great view of what's outside. When you're lying down in sleepy horizontal mode, you're positioned below the window, so less sunlight exposure, and a bit of protection from outside curious. Finally, the concept has gullwing doors, easing getting in and out, but kind of unwieldy for underground parking.

VW says the Gen Travel is totally electric, but the company hasn't released any information specific to the powertrain. Instead, Volkswagen says the Gen Travel has Electric Active Body Control that calculates the car's movements ahead of time and adjusts the suspension parameters accordingly, keeping things as smooth as possible. Interestingly, VWn also says the Gen Travel is capable of platooning, or driving in a convoy to increase range.



Volkswagen has made a radical concept designed to preview a future in which mobility-as-a-service vehicles drive themselves. No steering wheel in the cockpit.

The Volkswagen Gen.Travel concept is a design study, with a real prototype, they says “it gives a realistic outlook for the mobility of the coming decade”.

Aspects of the concept are expected to be transferred to series vehicles.

Tata Avinya Concept Interior Has Innovative Fabrics

THE DESIGN LOUNGE

TPEM IMAGE

A partnership between Ultrafabrics and Tata Passenger Electric Mobility (TPEM) will see Ultrafabrics' animal-free, high-performance fabrics being used for the interior of TPEM's new Avinya concept EV. TPEM has been established with TPG Rise Climate to offer new mobility solutions. TPEM aims to ride the green wave and support the government's vision to have 30-per-cent EV penetration in India by 2030.

For the interior, designers were inspired by the colors and crafts associated with Tata's Indian heritage. This resulted in Ultrafabrics' Fusion Shimmer (Copperhead) and Volar Bio (Silverstone) being used to create warmth, haptic qualities, a feeling of space and a sensorial experience for drivers and passengers inside the cabin. TPEM were said to have selected Ultrafabrics because of its innovative materials and use of renewable, bio ingredients—specifically in Volar Bio.

"The overall aesthetic of the Avinya concept has been designed with Global India and Indian locality in mind, combining warm terracotta with light grey," said Kyeong Shim, Tata's head of color material finish. "Using tactile materials, coupled with incense, has also created an environment that stimulates our senses in a subtle and comforting way.

The Avinya concept is based on TPEM's Gen 3 architecture, and its interior houses an array of new technologies including artificial intelligence software, and rotating seat. The vehicle's sky dome delivers additional space and natural light. TPEM's Avinya concept will be introduced to the market by 2025.

Fiat Lux

THE DESIGN LOUNGE

COFFEE CORNER
DVN
Interior

While exterior lights coexisted with the automobile, the first lights ever in a car interior that accentuated a colored mood were probably warning lights. Used for first time in the mid-30s for a purely functional purpose, unbeknownst to their creators, car interiors acquired a specific filmographic frame. Thanks to color hue and blinking sequence, all patterns of automotive ambience have been light-mapped since. It took several decades though before the very narrative of ambient light was seen as a specific automotive domain.

Ian Callumn, as Jaguar design director, stated in the early 2000s that lighting was going to be the next big thing and he proved it. Lighting has always led the theatrical quality of any architectural interior space, cars though never used this supreme perceived-quality of light to that very day. Technical progress along with lower costs for electronics and LEDs opened a new era of light design expressions in the interiors of luxury but also middle range cars, like Chrysler minivans, where cup holders glow at night.

At the 2007 Detroit auto show, the Jaguar C-XF concept car splashed a hidden-source blue light on surfaces, textures, and materials of its entire interior, affirming its design director's statement. A year later, in a project sponsored by the Detroit Institute of Ophthalmology—2008's Eyes On Design event award winner—the Cadillac CTS interior atmosphere benchmarked home interiors. A receded ceiling light, gave a very distinctive touch in the entire cabin when evening came.

Lincoln's MKR concept car interior showcased a cold blue tone in perfect harmony to its smooth yet precisely-cut interior. Mazda studied and presented accordingly two prototypes that treat light as the visual translator of a novel interior form language. 'Nagare' featured the theme of flow through textures and patterns as surface treatment and 'Ryuga's entire interior was designed and prototyped as a pattern to reflect 'flow'.

Volvo's XC60 concept showcased the Nordic blue interior light as its trademark, while Nissan 'bevel' in a completely different narrative, used light to emphasize the fundamental functions of its habitat. The contrast between the strictly practical interior lighting and its sleek car body affirmed 'bevel's strong identity: an 'athlete in tuxedo' as stated at press release.

Mercedes-Benz in 2013 decided to point out its leading role in lighting technology by creating the new S-Class as the first car that does not have a single light bulb on board. 500 LEDs, with 300 among them only for the interior, take on the mission of lighting the road, the vehicle and passenger and luggage compartments.

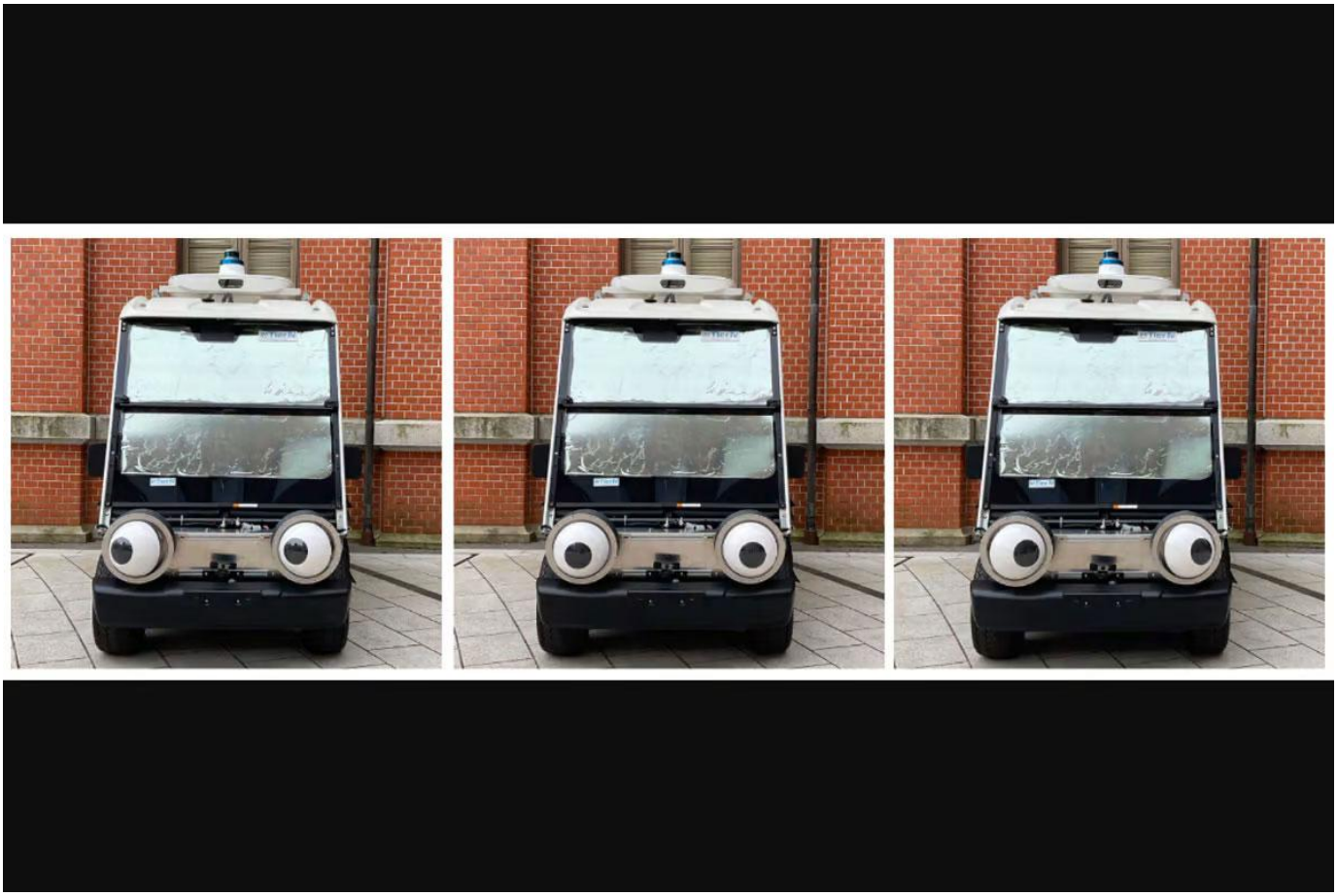
Beyond simply giving form to prisms and reflectors, lighting is used as an immaterial source of shaping (or perceiving) complex interior spaces.

'I never designed the object, I've always designed the light it reflects'
--Ingo Maurer 1932-2019, Industrial designer (nicknamed the poet of light)

News Mobility

Driverless Cars Should Have Eyes: Research

NEWS MOBILITY



GOLF CARTS WIDE-EYED “GAZING CAR”, AS USED DURING THE STUDY (CHANG ET AL, 2022)

When crossing the road in front of a car, pedestrians should make eye contact with the driver, to make sure they've been seen. What if the car has no driver? New research suggests the vehicle should then have surrogate eyes of its own.

Scientists at the University of Tokyo equipped a golf cart with non-seeing humanlike robotic eyes, which were operated by the driver. That person was hidden from outside view by a one-way mirror film on the windshield, making the cart appear to be driverless. An omnidirectional camera was used to shoot four videos in which the cart approached a crosswalk. In one video, it stopped and waited for a pedestrian, with the direction of its eyes' gaze suggesting that it had seen them. In another, it drove through without stopping, its eyes not looking at the pedestrian. The other two videos depicted the same two scenarios —stopping or not stopping—although the cart was not equipped with the eyes.

Eighteen adult volunteers (nine men, nine women) then viewed the videos via VR headsets, in which they saw the environment from the perspective of the pedestrian. They viewed the videos multiple times in random order, and in each case were given three seconds to decide if it was safe to cross the road in front of the cart.

It was found that men were more likely to cross when it wasn't safe (when the cart didn't look like it was going to stop), while women were more likely not to cross when it was safe (when the cart did stop). Both 'errors' occurred less frequently when the cart was equipped with the eyes—men reported that the situation felt riskier when the eyes were looking away from them, while women reported feeling safer when the eyes were looking at them.

The scientists do acknowledge that their findings might have been different in a larger-scale study, with a greater number of participants and scenarios. Nonetheless, they believe that eyes on driverless cars may be a good idea. A paper on the research was presented at the 14th International Conference on Automotive User Interfaces and Interactive Vehicular Applications.

This isn't the first study to suggest that it could be helpful. In 2018, tests conducted by Jaguar Land Rover indicated that pedestrians felt safer crossing in front of autonomous pods when the vehicles were equipped with moving eyes that 'watched' them.

QCraft Robotaxi with Nvidia is Industry First

NEWS MOBILITY

QCRAFT IMAGE

Chinese autonomous driving solution provider QCraft announced they have become the first company to complete the deployment of L^4 Robotaxis with Nvidia Drive Orin. They inaugurated a Robotaxi service, jointly provided with mobility service platform T3 Go, in Suzhou, Jiangsu Province. The Robotaxi deployment signified QCraft and Nvidia's first collaborative achievement after they reached cooperation a year ago.

The autonomous vehicles in the operational fleet are L^4 passenger vehicles installed with dual Nvidia Drive Orin. Powering the vehicles is QCraft's proprietary Driven-By-QCraft autonomous driving solution. It can easy take on the complex road conditions on urban open roads, and features fundamental functions like pedestrian and vehicle avoidance, automatic lane change, automatic steering, and traffic light recognition.

The challenges involve also complex traffic scenarios such as intersections with complex road conditions under elevated overpasses, precise positioning of multi-story parking buildings and continuous turning. QCraft's latest technology shows a more reliable perception ability, a smarter prediction, planning, and control ability, and a more efficient data closed-loop.

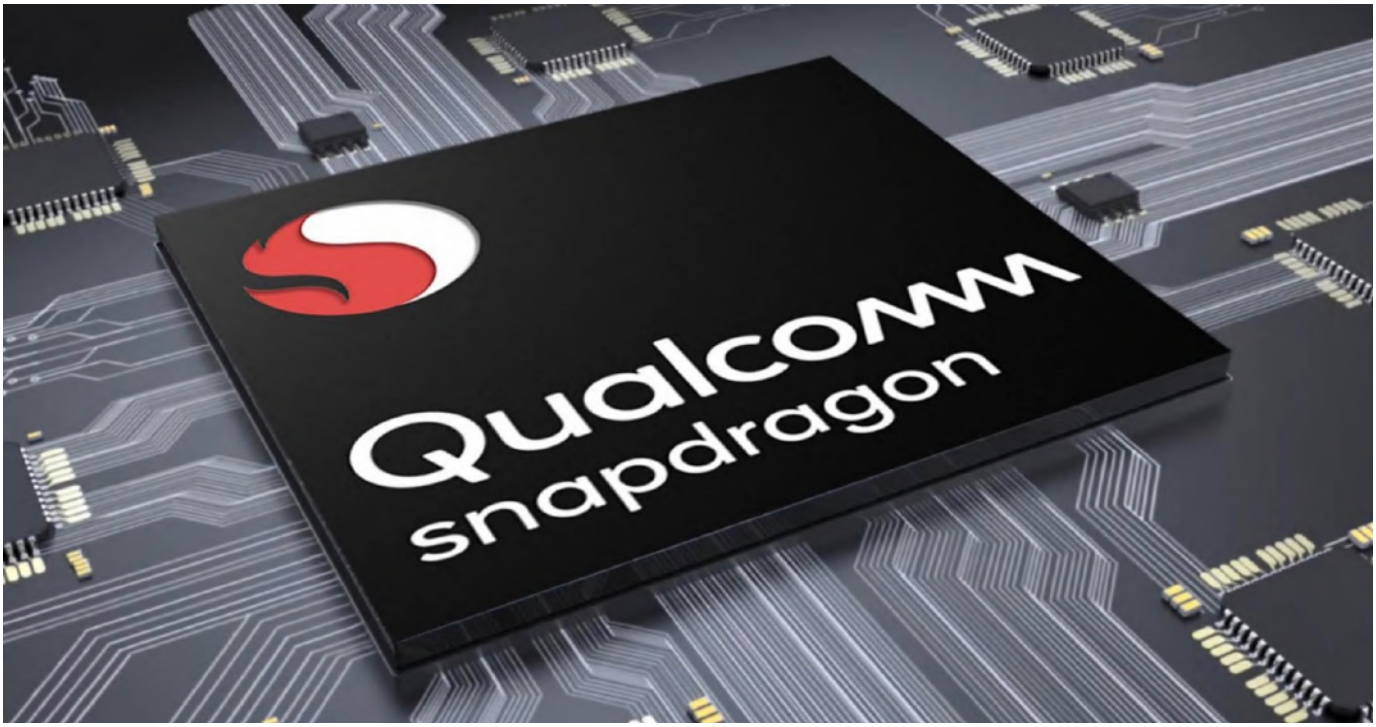
The solution is strong enough to deal with over 100,000 urban traffic scenarios. As the latest generation of NVIDIA's intelligent vehicle central computer, a single Orin chip can provide up to 254 TOPS (trillion operations per second), while dual Orins can provide up to 508 TOPS of computing power, tackling numerous applications and deep neural networks simultaneously. The Orin chip meets the system safety standards such as ISO 26262 ASIL-D.

The joint Robotaxi service is now online in Suzhou, Jiangsu Province. Users in the city are given an additional option of autonomous driving when choosing types of rides on the T3 Go ride-hailing mobile application.

General News

Qualcomm's Automotive Order Backlog Hits $30bn

GENERAL NEWS



QUALCOMM IMAGE

San Diego-based chip maker Qualcomm last week said their automotive business pipeline has increased to $30bn, up more than $10bn since their third-quarter results were announced in late July.

The jump in future business was thanks to their Snapdragon Digital Chassis product used by car makers and their suppliers. It can provide assisted and autonomous driving technology as well as in-car infotainment and cloud connectivity.

Qualcomm also announced an expanded partnership with Mercedes Benz which will use the Snapdragon Cockpit for their in-car infotainment system from 2023.

With electric vehicles and autonomous features increasing in cars, the number of chips used by automakers are surging and the automotive market has been a key growth area for chipmakers.

On a per-car basis, for a lower-tier car, it represented an opportunity of around $200 that scales up to $3,000 at the higher tier," said Akash Palkhiwala, Qualcomm's CFO. And, "Going forward, the mix will continue to shift to the higher end, so the opportunities will continue to grow."

Earlier this month, chipmaker Nvidia also unveiled a new automotive central computer called Drive Thor to provide autonomous and assisted driving as well as in-car digital entertainment and services.

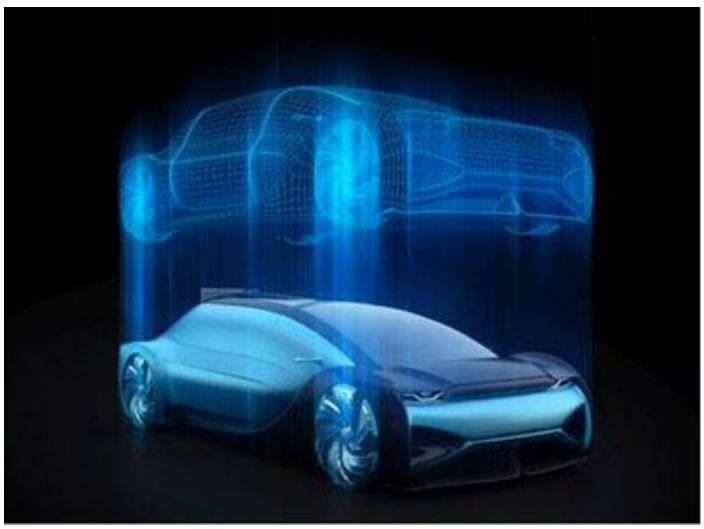
Digital Twins: What Benefits?

GENERAL NEWS

FAURECIA IMAGE

A digital twin is a virtual duplicate of a real system. Digital twins are indispensable for digitization. They make "what-if" analyses in virtual space possible.

A digital twin in automotive industry is a virtual replica of an entire car, software, mechanics, electrics, and physical behavior of a vehicle. The digital twin holds all real-time performance, sensor and inspection data, as well as service history, configuration changes, parts replacement and warranty data.



STOCK ADOBE IMAGE

What is the digital twin automotive use cases? It could be in product review and testing, adding manufacturing capacity, employee training, predictive maintenance, sales and even organization review.

It is irrelevant whether the counterpart already exists in the real world or will exist in the future. Digital twins contain data and algorithms, often simulation models, that accurately describe their real-world counterpart.

Faurecia, together with Dassault Systems, plans to use virtual twin experiences to model, simulate and optimize the entire product development process.

In the upcoming Digital Production Twins Forum in Nürnberg, Valeo will be describing the path to the digital production twin, with the biggest challenge is the immense amount of data that must be collected and evaluated in the manufacturing processes.

Around the world, digital twin technology is gaining traction, according to a recent survey by Altair, which included more than 2,000 professionals worldwide. According to the computational science and artificial intelligence (AI) company, nearly three in four companies (69 per cent) would already use digital twins. And two out of three respondents (67 per cent) expect digital-twin solutions to make physical prototypes obsolete in the next six years.

Today, vehicles already generate large amounts of data over their entire life cycle. With growing connectivity and digitization, the amount of this data continues to increase. Digital twins represent a possible method for effective use of the data, for example for product development, condition monitoring, diagnostics or optimization. To create digital twins, a precise data model is needed that shows data structures and components.

A central challenge for the realization of digital twins is the integration of simulation models of individual digital twins into a simulation of the overall system, explains Thomas Kuhn from Fraunhofer IES. The Functional Mockup Interface (FMI) is a technology that realizes this. In addition to the technical integration of simulation models, it must be ensured when integrating digital twins that the exchanged data match each other and that they are also understood by other twins in the same way. For this, the meaning of a data value must be clearly defined. Experts still see the biggest challenge for the development of digital twins in a lack of monetary arguments and overcoming interface problems.