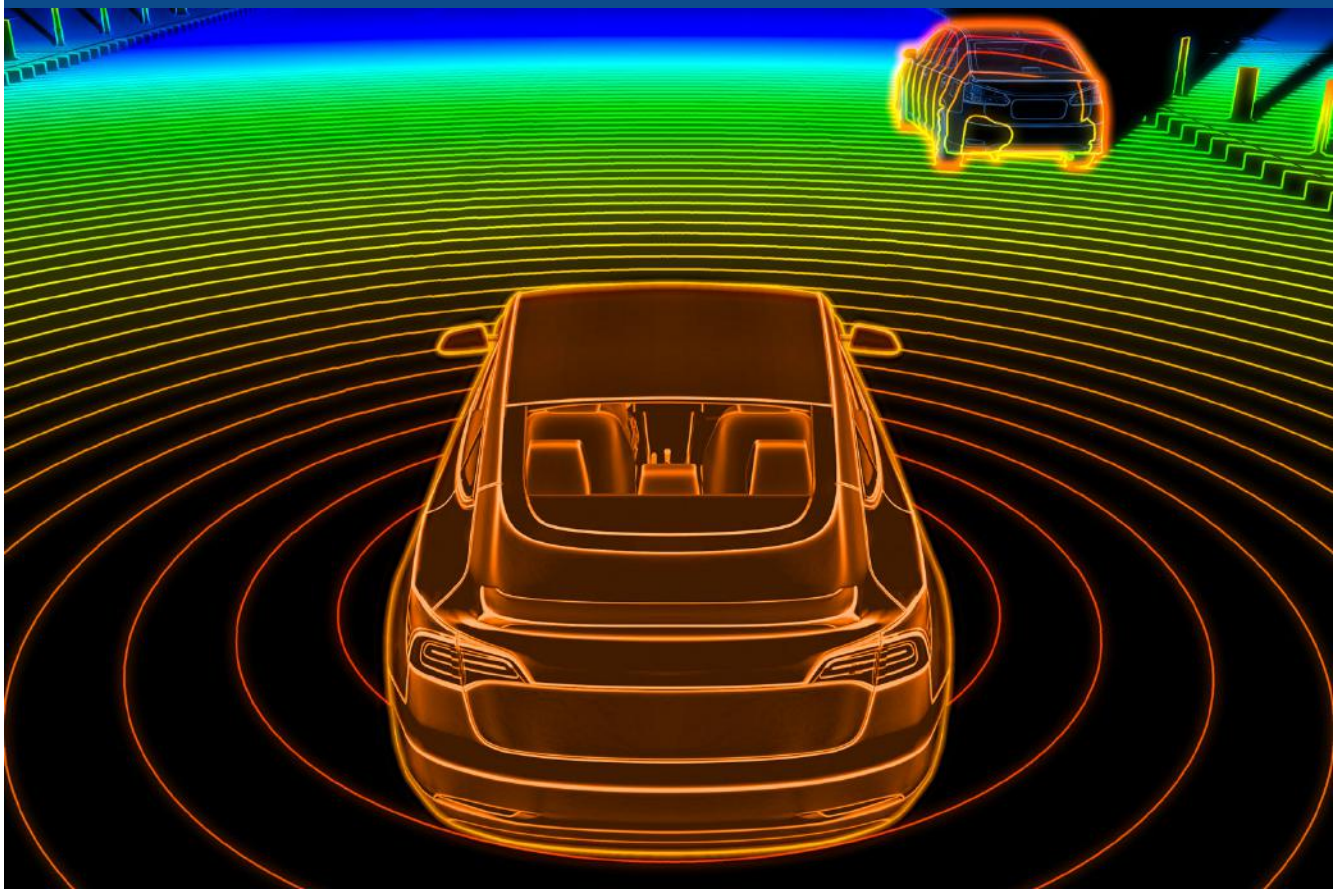
DVN

Sensing & Applications

Monthly newsletter #2.1

FEBRUARY 5, 2025



EDITORIAL

AI, a game changer for ADAS Perception Systems

The large deployment of AI in Sensing Systems will lead to a much-improved performance of perception systems. This is what we see for the computer vision technology but also for radars (see Perciv.ai interview) and lidars (Mercedes Drive Pilot increased maximum speed of 95kph was mainly achieved by a Software change on Lidar).

Last but not least, we see end-to-end software launching in China for Navigation on Autopilot (NOA) Systems: AI should speed-up the deployment of L2+ Systems, also in EU,US. Machine Learning algorithms and ECUs enable the processing of vast amounts of data in real-time, providing perception systems with immediate, meaningful insights and empowering decision-making.

In this 2^{d} edition of the DVN “Sensing” Newsletter, you will see the benefits of AI in our interview of Perciv.ai, CES 2025 special report and news about Camera / Radar / Lidar technologies. (20 articles)

"Save the Date" - DVN Events 2025

- AEB Workshop – NHTSA / FMVSS 127 (Detroit 09-10 April)
- CN- EAC Lidar Tech Expo (Hangzhou 04-06 June), co-hosted by DVN
- EU- 8th Lidar & ADAS Conference, NOA/L2+ Systems (Frankfurt area 17-18 November)

We're ever so glad you're here with us in the DVN community!
All best,

Alain Servel

DVN Sensing Advisor

INTERVIEW

Interview: Perciv.ai / Dr. Andras Palffy – Director of Technology

Andras Palffy received the M.Sc. degree in computer science engineering from Pazmany Peter Catholic University, Budapest, in 2016, and the M.Sc. degree in digital signal and image processing from Cranfield University, U.K., in 2015.

From 2013 to 2017, he was an algorithm researcher at Eutecus, a US based startup (later acquired by Verizon) developing computer vision algorithms for traffic monitoring and driver assistance applications.

He obtained his Ph.D. degree in 2022 at Delft University of Technology, Delft, Netherlands, focusing on radar based vulnerable road user detection for automated driving.

In 2022 he co-founded Perciv AI, a machine perception startup developing AI-driven, next generation machine perception for radars.

DVN-1: Perciv.ai is a start-up created in 2022 in the Netherlands and has raised new funding end of 2024. Could you tell us the purpose of the company and where you are today?

Perciv AI's mission is to democratize automated systems and vehicles by helping them understand their environment in a weather robust and scalable way. To do this, Perciv AI develops AI-driven machine radar perception solutions. We believe that radars are not exploited to their limits, and just like cameras and LiDARs, they can be pushed beyond their traditional limitations with dedicated AI, and perform extremely well for a cheaper price - even in adverse weather conditions.

DVN-2: Which kind of product / software are you developing?

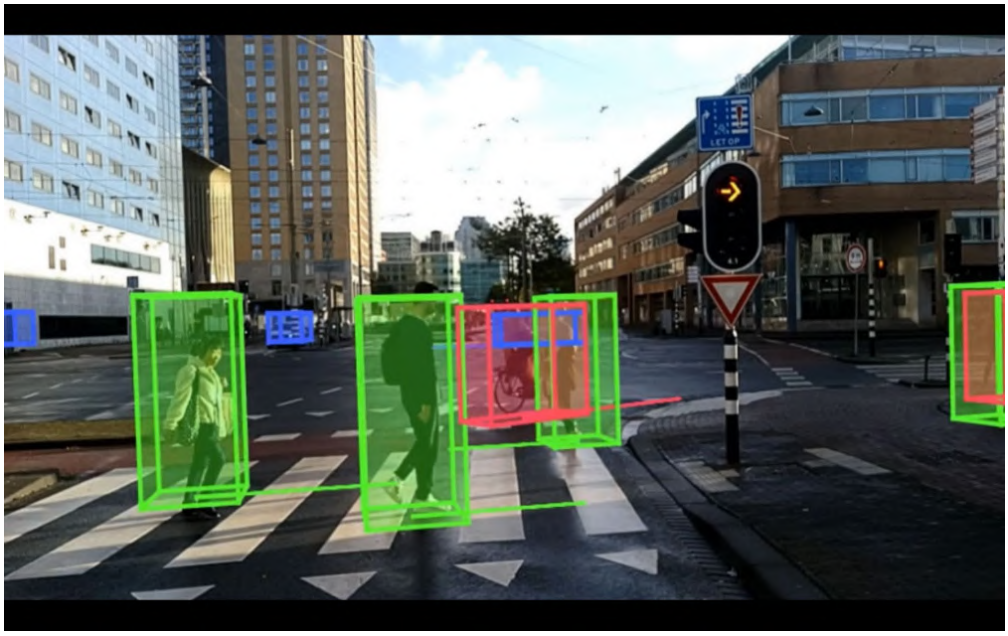
Our product is *software development kit (SDK)*, that can be integrated into various host systems using different radar sensors and computation architectures. Our software has three main features:

1. Perciv-Objects: A state-of-the-art, radar-only object detection, classification, and tracking module, providing an object list with unprecedented quality for radar systems. It can also be fine-tuned or retrained for specific objects of interest to the customer, handling classes that are often not addressed by conventional automotive radar perception software.

2. Perciv-ClearWay: Drivable Surface Estimation feature, estimates where the vehicle can drive regardless of the class of the obstacles, even if they are not classified (e.g., lost cargo, animals, or other objects for which we do not explicitly train). This feature can also be considered a generic collision avoidance feature.

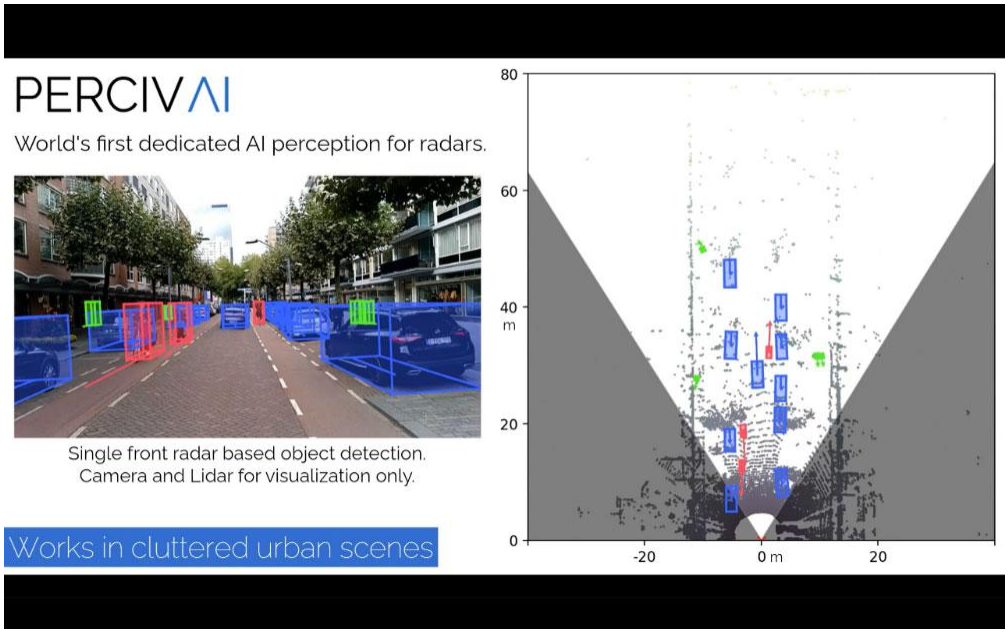
3. Perciv-EgoTrack: Perciv-EgoTrack utilizes radar input to estimate vehicular movement, including location, orientation, and velocity. This technology is particularly valuable for localization in instances where GPS is unavailable, for example, in parking garages or urban canyons.

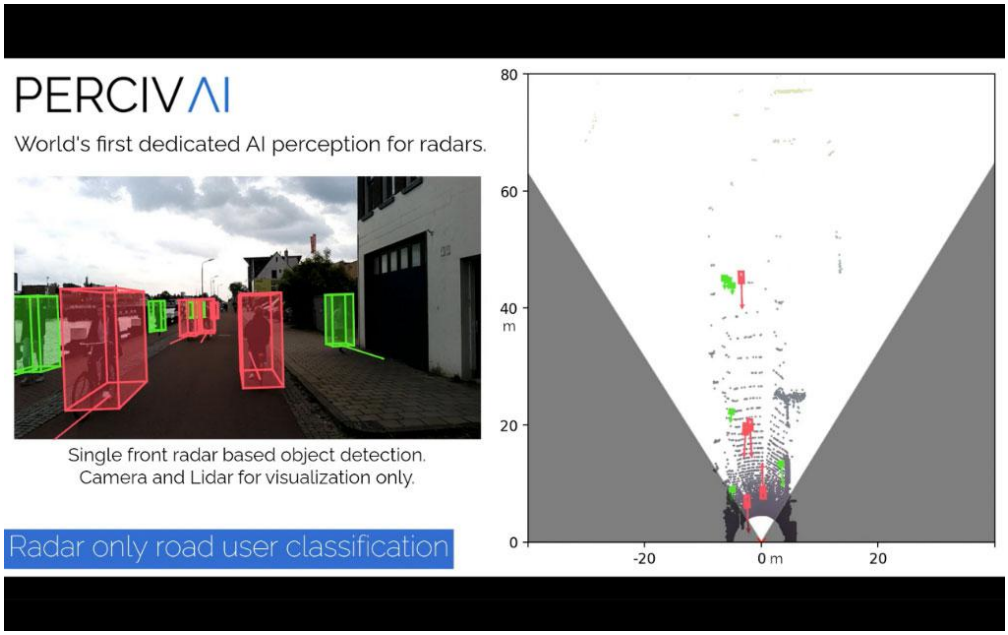
It is important to note that these features are not solely intended for traditional "on-highway" automotive applications. Our SDK addresses similar challenges across various operational environments, including indoor settings (e.g., logistic centers, forklifts), outdoor environments (e.g., delivery robots, utility vehicles), and offroad settings (e.g., construction and agricultural vehicles).



DVN-3: Which performance & KPIs will you improve? Which critical use cases will be solved

Perciv AI significantly outperforms current radar perception algorithms in classification (e.g., person versus cyclist versus car) and occupancy mapping, and often rivals the performance of lidar-based systems. Therefore, our technology could be a solution for any use case that requires weather-robust, privacy-safe, and, most importantly, cost-efficient 3D perception. A prime example of such a need is the upcoming automotive regulations in both North America and Europe, which require reliable pedestrian detection even at night—a feat not achievable with cameras or current radar perception algorithms. Original equipment manufacturers (OEMs) can decide whether to invest in lidar sensors, which drastically increase the price, or improve the radar perception stack, potentially by using Perciv AI's solutions.





DVN-4: What is your competitive advantage compared to the existing radar suppliers?

We perceive our offering as an entirely new offering in the radar value chain. Unlike radar manufacturers, we do not sell the sensor hardware itself; in fact, our solution is highly hardware-agnostic and can function with multiple vendors' devices. This means that hardware manufacturers currently struggling to make not just great sensors but also great software, have a chance to challenge market leaders by collaborating with Perciv AI.

DVN-5: NTHSA has recently published a new specification for Pedestrian AEB in dark conditions, more stringent than the EU or NCAP specifications. Could your Software bring a significant improvement of the current systems (cameras / radar)?

The new NTHSA regulations are indeed more stringent than most of the important specifications currently in place, and we believe that others will follow the trend they have just set.

As explained above, this poses a huge challenge for OEMs, as current camera and radar-based solutions will not suffice. We strongly believe that with our advanced AI-driven radar perception, however, the regulations could be met without introducing new, expensive sensors to the vehicle. We will release relevant recordings proving this later this year.

DVN-6: When will you have a mature product / Software for automotive applications, with a full validation on public roads. Will you use existing data and validate your software with a SIL process?

Depending on the exact features, scope, and geography, the definition of mature product varies. That being said, we are working hard towards multiple certifications in 2025 and plan to have deployed software first in L4 shuttles in 2026, and in on-road cars/trucks around 2028-2029.

DVN-7: Do you have contacts with potential customers, are they OEMs or Tiers1?

We have more than five advanced PoC projects with different automotive players, including European and Asian OEMs and Tier1-s. Beyond that, we have more than eight customers (robot OEMs) in the industrial domain. These are not potential customers, but currently customers of Perciv AI, recognising that necessity of dedicated AI for radar.

DVN-8: Have you been successful at CES 2025? Could you tell us more about the benefits of this event for a start-up like yours

Perciv AI's CES 2025 was a great success. The booth with its two live demo, demonstrating our Radar Perception SDK, attracted significant attention, drawing in over 400 visitors throughout the event resulting in over 100 promising leads.

Furthermore, CES facilitated valuable interactions with existing clients, with more than 20 customer meetings taking place during the event. This is yet another indicator that CES is not just a consumer show anymore - it is in fact one of the biggest automotive shows in the world, and thus, very important for startups like Perciv AI.

The event also provided an opportunity for us to connect with our US clients - for some, it was the first face-to-face meeting with Perciv AI!

DVN-9: Could your product / software be used for other technologies like cameras, Lidars?

We use to say that we are not a radar company - we are a machine perception company, that beyond cameras and lidars, can **also** work with radars, which is a very unique capability currently. We often work with the other sensors as well either for ground truth generation of sensor fusion for example. Furthermore, we are in close contact with 4D lidar companies, as their output - a point cloud with x, y, z and velocity dimensions - are very similar to radar point clouds, and thus, our algorithms could work with it just as well. This means that Perciv AI could be one of the first AI perception providers for the upcoming trend of 4D lidars.

DVN-10: Do you think that Radar + Camera perception systems can outperform Lidars. In such case what are the main advantages of Radar + Camera fusion by comparison with Lidars?

We strongly believe that an advanced radar-camera fusion system can challenge a lidar based one in most applications, including, but not limited to automotive. the most straight-forward advantage is of course the significantly lower cost compared to (similarly performing) lidar sensors. However, that is not all - the fusion approach brings in redundancy in case of sensor failure, adds robustness against challenging weather conditions, and also provides information at a longer range.

DVN-11: Imaging Radars hardware becomes more and more complex to reach sufficient resolution requirements in azimuth and elevation. Do you think that distributed radars architectures could be a solution to reach such requirements?

This is a very hot topic currently in the radar world—at every conference, experts argue for and against dense arrays, sparse arrays, and distributed radar architectures.

We see some advantages and disadvantages for all. The distributed approach, in particular, is very attractive because of the increased angular resolution—a well-known weakness of current radar systems. On the other hand, it increases the price by requiring more sensor “heads” and highly accurate temporal and spatial calibration. Interestingly, for our technology, the hardware architecture is irrelevant—we take the best point cloud or radar cube data available from the sensor and perform the best possible perception on that data, regardless of whether it is from a dense array or distributed approach, for example.

SPECIAL REPORT

Special Report on CES 2025

Martin Booth (DVN) attended CES 2025 in Las Vegas and reported on the latest innovations in sensing systems for Advanced Driver Assistance Systems (ADAS).

Software-defined vehicles (SDVs) are becoming increasingly important, with automakers transitioning from hardware updates to OTA software updates. This shift necessitates the use of versatile hardware platforms, such as those offered by Valeo, LG, or TI's zonal architecture, which aim to reduce the complexity of embedded architectures.

We can highlight in this report, the following showcasing companies:

- **Valeo** showcased SDV solutions, including a cloud-based development suite and a Qualcomm-based system capable of managing ADAS and IVI on a single platform.
- **Qualcomm** has engaged in discussions with partners, including BMW, about the growing integration of Advanced Driver Assistance Systems (ADAS) and In-Vehicle Infotainment (IVI) into a single Electronic Control Unit (ECU).
- **Magna** focuses on a total system approach, with partnerships for thermal cameras and imaging radars.
- **Mobileye** showed off the **Eyeq6** processor, scalable from L2+ to Robotaxi, with systems using up to 9 lidars and 13 cameras.
- **Hailo** presented demonstrations of **AI processors** embedded in automotive applications.
- **Aptiv** unveiled its latest ADAS **Gen6 platform** with advanced perception solutions.
- **Nvidia** has highlighted its COMOS platform for the development of **physical AI**, including autonomous driving.
- **Waymo** showed off its 6th generation of Robotaxi, with improvements to reduce hardware costs and better withstand the elements.

In summary, ADAS is becoming more and more common with new features being added regularly. Camera-based systems are excellent for L2/L2+ driving, but radars and lidars will become more important for L3 levels and beyond. Robotaxi's services are starting to expand, and as hardware costs decrease, many more deployments are expected.

You will find the report entitled "CES ADAS Report January 2025 – DVN" on our website.

SENSING BUSINESS

Sensing Business News

Hesai Technology secures LiDAR supply contract for several Dongfeng Motor's brands

On January 22, Hesai Technology announced an exclusive mass-production agreement with Dongfeng Motor for multiple brands and vehicle models, including its premium new energy vehicle brand VOYAH. Under the agreement, starting in 2025, these vehicles will feature Hesai's compact, ultra-high-definition long-range LiDAR, the ATX, delivering an enhanced intelligent driving experience. Since September 2024, VOYAH's monthly sales have surpassed 10,000 units for four consecutive months, culminating in a record-breaking volume in December.

Hesai Secures Design Wins for Multiple Chery Models, Mass Production to Begin This Year

On January 21, Hesai Technology announced design wins for several Chery Automobile models, which will feature the latest ATX lidar in mass production by late 2025. Chery's lineup includes passenger cars, commercial vehicles, and urban mobility vehicles. In 2024, Chery sold 2.6 million vehicles globally, up 38% year-over-year, with over 3 million deliveries expected this year. Chery exported 1.14 million vehicles in 2024, a 21.4% increase from the previous year. By December 2024, Hesai secured over 100 design wins across 21 automotive OEMs, including Chery, Great Wall Motors, and Changan.

Seyond allies with Go Further.AI to advance functional autonomous vehicle applications

On January 20, LiDAR manufacturer Seyond announced a strategic partnership with last-mile delivery solution provider Go Further.AI to expedite the development of functional autonomous vehicle solutions. This collaboration combines Seyond's high-performance LiDAR technology with Go Further.AI's advanced autonomous driving systems, focusing on applications in last-mile logistics, smart shuttles, sanitation, and scenic area management sectors. Go Further.AI specializes in sophisticated autonomous driving technology and intelligent logistics solutions.

RoboSense, COWAROBOT deepen partnership to advance urban autonomous solutions

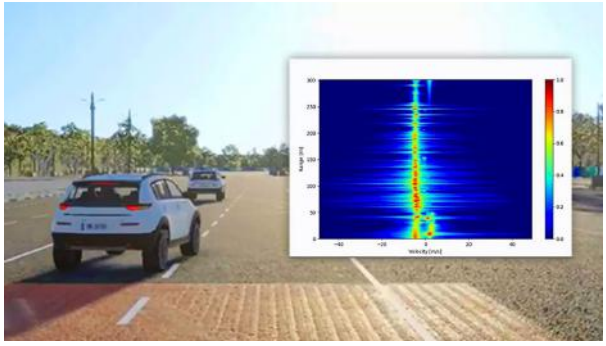
On January 12, RoboSense and COWAROBOT announced an enhanced strategic partnership to drive innovation in urban autonomous solutions. Leveraging RoboSense's new-generation digital **LiDAR** technology and robotic mobility solutions, the two companies aim to accelerate the commercialization of intelligent robots in urban scenarios and lead the transformation of city services through automation.

RoboSense, Pony.ai announce all-around partnership expansion

On January 08, RoboSense and Pony.ai announced an expanded strategic partnership at CES 2025. As intelligent robotics continues to shape the future of mobility, the two companies have reached a consensus to deepen collaboration in the AI era, targeting autonomous driving and transport services across various high- and low-speed scenarios. The partnership will integrate RoboSense's new-generation **digital LiDAR** with Pony.ai's autonomous driving domain controller, Land ("Fangzai"), delivering comprehensive, one-stop smart driving solutions.

Long-term deal with Aurora Innovation expected to scale deployment of autonomous freighting technology.

On January 07, Aurora Innovation, the US-based developer of autonomous driving technology utilizing high-end lidar alongside radar and cameras, has announced a deal that is expected to help scale its deployment in driverless trucks. The strategic agreement, revealed during the CES 2025 event in Las Vegas, features AI computing leader Nvidia and car parts giant Continental. Nvidia's "DRIVE Thor" and "DriveOS" systems are set to be integrated with the Aurora Driver system, with the "Level 4" self-driving technology currently slated for mass production in 2027.



Ansys and Cognata offer ADAS/AV sensor testing on Microsoft Azure

On January 06, Ansys has partnered with Cognata and Microsoft on a web-based automated driving perception platform (ADPH). The ADPH runs on Microsoft Azure and fourth-generation AMD EPYC processors and Radeon PRO GPUs. ADPH gives OEMs easy access to web-based sensor models from manufacturers, enabling collaborative testing and validation of ADAS and AV functions using a high-fidelity simulation platform with virtual twin technology. The ADPH allows OEMs and sensor manufacturers to test and validate certified sensors against diverse industry standards, including those put forth by the National Highway Traffic Safety Administration (NHTSA) and the New Car Assessment Program (NCAP).

Black Sesame Technologies unveils Huashan A2000 chip platform for next-gen AI models

On December 30, Black Sesame Technologies introduced its Huashan A2000 family, a high-performance chip platform designed for next-generation AI models. The Huashan A2000 family represents a significant leap in autonomous driving technology. These chips integrate industry-leading CPU, DSP, GPU, NPU, MCU, ISP, and CV units, achieving high integration and multi-tasking capabilities on a single chip. Advanced ISP technology with 4-frame exposure and 150dB HDR improves performance in tunnels and nighttime scenarios, enhancing image processing capabilities. The A2000 family natively supports Transformer models and provides flexible scalability for multi-chip configurations, covering applications from NOA (Navigation on Autopilot) to Robotaxi.

Gapwaves and Smartmicro have entered into a new agreement regarding waveguide antennas for high-resolution radar sensors.

On December 23, Gapwaves and Smartmicro have signed a new agreement concerning the sale and supply of waveguide antennas for high-resolution radar sensors. The agreement has an expected sales value of approximately MSEK 90 for Gapwaves, with deliveries expected to start ramp up in Q1 2025. Smartmicro is a leading company in radar sensor technology and products for traffic management and automotive applications. Gapwaves and Smartmicro started collaborating in 2020, working together on various development projects involving Gapwaves' waveguide antennas. Gapwaves is still on collaboration with Hella and Bosch.

LIDAR TECHNOLOGY

Lidar technologies News

Voyant Photonics showcased its new Carbon FMCW LiDAR sensor at CES 2025

Aimed at industrial applications, Voyant Photonics demonstrated its frequency-modulated continuous-wave (FMCW) LiDAR sensor with highly accurate detection and tracking of moving objects up to 200 meters. The company integrated optics on a LiDAR photonic IC to achieve a low-cost 4D LiDAR sensor that it claims will revolutionize machine perception capabilities in industrial, robotics and security applications. This highly integrated, fingernail-sized silicon photonic chip provides high resolution and object detection up to 200 meters with a precision of <2 cm.

Named Carbon, the FMCW LiDAR sensor is powered by the LiDAR-on-a-chip with solid-state beam steering. The FMCW technology allows for instant velocity at each point in addition to traditional distance, reflectivity and intensity measurement. This provides 4D capability, delivering high-fidelity point-cloud data with high accuracy, as well as a real-time view of the environment up to 20× per second. The instant velocity enables vehicle ego positioning, which is extremely efficient in GPS-denied environments, the company said.

The Carbon LiDAR sensor is also a fraction of the cost of competing best-in-class LiDAR solutions, according to the company.

The compact LiDAR sensor weighs 250 grams. Key specifications include a high resolution of native 128 lines per frame for camera-level resolution, 1.3-cm range precision and a field of view of 45° vertical and 90° horizontal. The maximum detectable radial velocity is 63 meters/second (140 mph).

The sensor's software-defined LiDAR allows for modifying the frame rate and adjusting the field of view during operation to focus on a zone of interest when and where it is needed, making any small object detectable and classifiable, the company said.

When compared with best-in-class ToF LiDAR, Voyant claims that the Carbon LiDAR sensor outperforms these solutions when operating through dust, fog, rain, snow and sunlight. The technology is also invulnerable to highly reflective objects including retroreflectors (street signs, traffic cones and safety vests).

The LiDAR sensor offers IP67 dust and water protection and strong shock and vibration endurance. The low power required by the FMCW laser technology ensures eye safety.

Carbon LiDAR anticipates a future TITANIUM version which would have the following specifications:

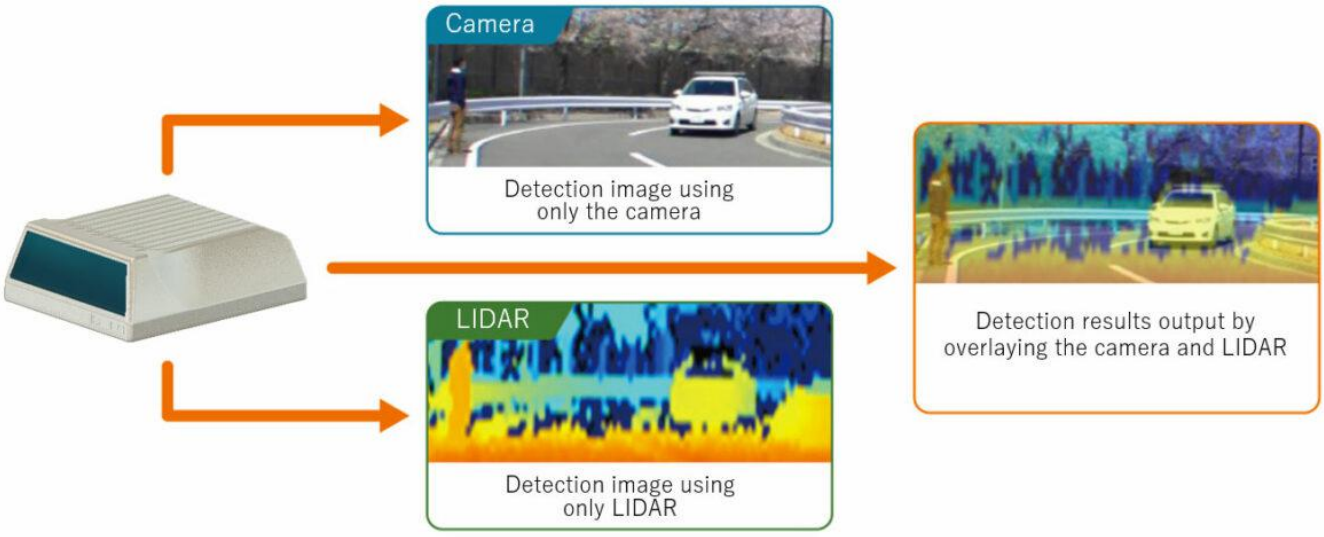
- 500 m range max range
- 200 m range @ 10%
- 1 cm range precision
- 0.6 cm/sec velocity precision
- Up to 120° Horizontal Field of View
- Up to 20° Vertical Field of View
- 0.045° vertical resolution
- Up to 2.86 million samples per second

DVN comments

Voyant also collaborates with NVIDIA Isaac Sim. This enhanced simulator provides an advantage for customers because it now enables the full modelling of Voyant's FMCW LiDAR to deliver instantaneous measurements of both range and velocity for every data point. This aligns the capabilities of Voyant's sensors for advanced 3D perception. This step enhances the accessibility of Voyant technology, allowing customers to independently validate and optimize performance within their specific applications.

Kyocera Unveiled the World's First Camera-LIDAR Fusion Sensor with Perfect Optical Alignment at CES 2025

Kyocera’s technology has a cutting-edge precision with unmatched laser irradiation density for parallax-free, long-distance obstacle detection ideal for Autonomous Driving.



Kyocera Corporation recently developed the Camera-LIDAR Fusion Sensor, the first LIDAR to align the optical axes of both the camera and LIDAR into one sensor. This design enables real-time acquisition of parallax-free superimposed data. It also features the highest laser irradiation density among LIDAR sensors, allowing for long-distance and high-precision object detection.

LIDAR is crucial for autonomous driving's commercialization. It quickly captures long-range, accurate 3D data, detecting obstacles in complex environments and at high speeds with precision. LIDAR excels at spatial recognition, determining an object's distance and size from reflected laser light over a wide area. Typically paired with cameras, it often faced delays due to sensor calibration issues. Kyocera's new Camera-LIDAR Fusion Sensor combines the camera and LIDAR in one unit, providing parallax-free, real-time data integration for efficient and accurate results.

Key Features:

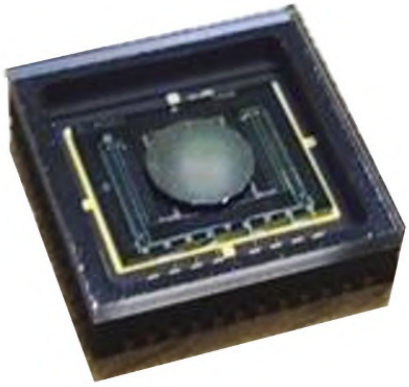
- **Camera and LIDAR integration for most accurate object recognition**

Kyocera has developed a technology to integrate the camera and LIDAR into a single unit with aligned optical axes. This integration allows for real-time combination of camera image data and LIDAR distance data, enhancing object recognition capabilities.

- **High Resolution with World's Highest2 Laser Irradiation Density**

LIDAR can detect small obstacles over long distances by increasing laser beam density, enhancing resolution and accuracy. Kyocera's sensor uses a 0.045-degree irradiation density with proprietary laser scan technology from MFPs and printers, enabling it to detect a 30cm object falling from 100m away.

- **High Durability with Proprietary MEMS Mirror**



In LIDAR, a MEMS mirror or motor is required to irradiate laser light over a wide and high-density area. However, MEMS mirrors typically have lower resolution and motors tend to wear out quickly. Kyocera's new integrated sensor provides both higher resolution than motor-based systems and greater durability than conventional MEMS mirrors. A proprietary MEMS mirror, developed with Kyocera's advanced manufacturing and ceramic package technologies, and high-resolution laser scanning technology, support high-precision sensing for various industries including autonomous vehicles, marine/ships, heavy machinery, and more.

Customization Options

Kyocera customizes solutions for various applications, offering total control from MEMS mirrors to software. This integrated sensor targets automotive and other fields like construction machinery, ships, robots, and security systems.

DVN comments

Aligning Lidar and Camera optically can be beneficial. The Camera provides high resolution for azimuth and elevation, while Lidar excels in depth resolution. Merging their data accelerates object segmentation and instantly calculates object speed using Lidar's depth information. There can also be a synergy between these two sensors: Lidar can help to define the area in an image where the optimal sensitivity needs to be adjusted by the camera’s shutter. If the Lidar has a programmable scanning profile, the camera can assist in determining it through image analysis.

Aeva Introduced Atlas Ultra, Its Slimmest High-Resolution Long-Range 4D LiDAR Sensor at CES 2025

Aeva®, a leader in next generation sensing and perception systems, announced Aeva Atlas™ Ultra, its newest 4D LiDAR sensor built to meet the performance demands of SAE Level 3 and 4 automated driving systems in passenger and commercial vehicles. To enable safe travel at highway speeds, Atlas Ultra provides up to three times the resolution of Atlas, and configurable field of views with up to 150 degrees of vision across the horizon. On-sensor perception software enables unique detection capabilities at a maximum detection range of up to 500 meters. A 35% slimmer design makes Atlas Ultra ideal for passenger cars in roofline and behind windshield integrations with minimal impact to vehicle styling and aerodynamics.

“Atlas Ultra is our most powerful LiDAR sensor designed for the performance needs of L3 and L4 highway driving,” said Mina Rezk, Co-Founder and CTO at Aeva. “In recent years, Aeva’s development of 4D LiDAR and our production programs with multiple top global automotive OEMs have led to the versatile Atlas Ultra product. We believe that Atlas Ultra, along with its on-sensor perception and localization features, offers advantages for passenger and commercial vehicle OEMs interested in highway speed functionality.”

Delivering Industry-leading Performance

Aeva's FMCW 4D LiDAR technology detects velocity and position simultaneously, enhancing safety and automation. With instant velocity data, automated driving systems detect important objects faster and more accurately from greater distances.

Atlas Ultra meets highway-speed autonomous driving needs with a 250-meter range for low-reflectivity targets and up to 500 meters maximum range. It provides clear perception in various scenarios, immune to interference from sunlight, other LiDAR sensors, and retroreflective objects.

On-Sensor Perception Capabilities

Leveraging per point velocity information, Atlas Ultra provides perception and localization outputs directly from the sensor to enable unique capabilities, while helping to reduce compute costs. These capabilities include:

- Detection of Small Objects in Roadway: Identify small objects on the roadway and differentiate retroreflective lane markers from non-drivable road hazards, such as small bricks or tire fragments, at distances up to 150 meters.
- Dynamic Object Detection and Tracking: Detect and track the position and velocity of all dynamic objects with centimetre accuracy at up to twice the distance of conventional 3D time-of-flight LiDAR sensors.
- Late Reveal Dynamic Object Detection: Instantaneously detect dynamic objects that suddenly appear even while remaining partially obstructed, such as a pedestrian or animal emerging onto the road from behind a parked car or thick vegetation.
- Lane Lines & Drivable Region Detection: Detect Lane lines and determine drivable regions.

- Aeva Ultra Resolution™: A real-time camera-like image that provides a high-density point cloud resolution.
- Advanced Vehicle Motion Estimation: Estimate vehicle motion in real-time with six degrees of freedom for accurate positioning and navigation without the need for additional inertial or positioning sensors.

Advanced AI Perception Capabilities

Additional advanced perception functions harness the latest AI-based detection, tracking and classification algorithms. These advanced perception algorithms utilize per point velocity information to deliver advantages for automated vehicle systems.

- Pedestrian & Vehicle Detection: Detect, classify and track static and dynamic objects including vulnerable road users (VRUs) such as pedestrians, bicyclists, and motorcyclists, as well as a large range of vehicle classifications including passenger cars, trucks, buses, emergency vehicles and more.
- Semantic Segmentation: Per-point segmentation of the entire point cloud classifies points as: pedestrians, vehicles, lane markings, drivable regions, road signs, infrastructure, vegetation, and more.

Powered by Aeva Custom Silicon

The advancements in Atlas Ultra are powered by custom silicon including the Aeva CoreVision™ Lidar-on-Chip module, and Aeva X1™ System-on-Chip processor.

- Aeva CoreVision: Designed to strict automotive standards, Aeva's fourth-generation LiDAR-on-Chip module incorporates all key LiDAR elements including transmitter, detector and an optical processing interface chip. Built on Aeva's proprietary silicon photonics technology, CoreVision replaces complex optical fibre components with silicon photonics, ensuring quality and enabling mass production at affordable costs.
- Aeva X1: Aeva's powerful FMCW LiDAR System-on-Chip processor seamlessly integrates data acquisition, point cloud processing, scanning system and application software into a single mixed-signal processing chip. Designed for dependability with automotive-grade functional safety and cybersecurity built in.

Meets Automotive Requirements

Designed to meet challenging OEM requirements across passenger and commercial vehicle applications, Atlas Ultra meets automotive grade requirements for functional safety ISO 26262 ASIL-B (D), cybersecurity ISO 21434, and is IP69K compliant for robust dust and water protection, and strong shock and vibration endurance.

DVN comments

FMCW lidar can quickly distinguish between fixed and moving points, enabling localization of ground and obstacles in the 3D image. The high distance and speed resolutions of each point in FMCW Lidar's point cloud can enable a precise vehicle 3D odometry by analysing echoes from the ground and static objects. This may overlap with inertial sensing systems typically used in autonomous vehicles. With Aeva's Lidar, ego motion tracking can continue during adhesion losses, even when vehicle speed is inaccessible due to wheel blockage.

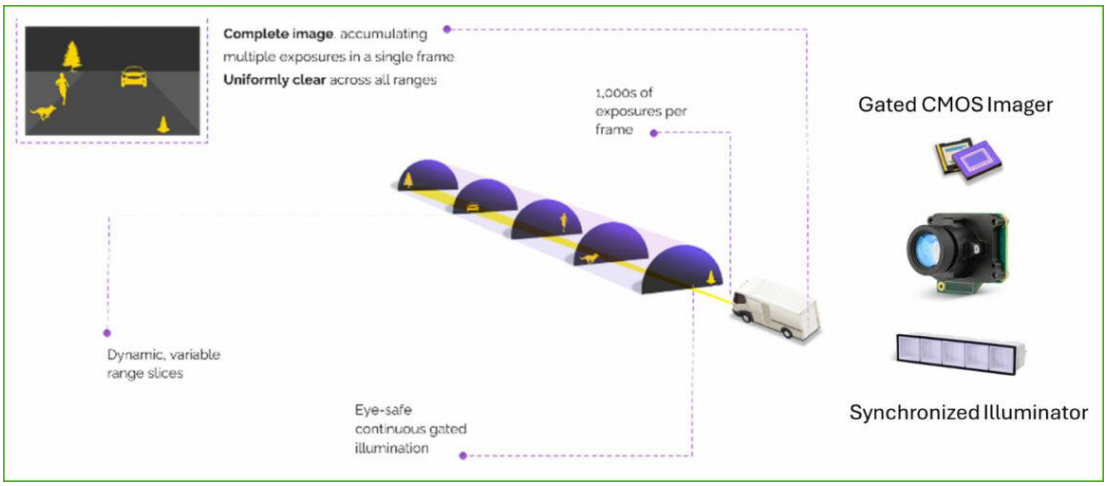
CAMERA TECHNOLOGY

Camera technologies News

Bright Way Vision gated camera has been tested along the recent AI-SEE project

VISDOM camera is a market-ready CMOS-based imaging system that enhances the safety and visual perception of driver-assisted and autonomous vehicles. Powered by Bright Way Vision's proprietary Gated Vision technology, VISDOM has been tested and proven fully operational under stress-test weather and lighting conditions: fog, rain, snow, darkness, and glare blindness. Designed for AI recognition system, VISDOM's algorithm is also the only one that uniquely alerts for untrained objects, with a DB set of over 100,000 classified, annotated, road-related objects.

Bright Way's Gated Vision principles



Gated Vision uses eye-safe NIR illumination pulses to generate 'slices' of the space ahead, while thousands of synchronized micro exposures of the gated camera build a complete illuminated image of the road ahead. Two crucial elements are involved in this gated vision system:

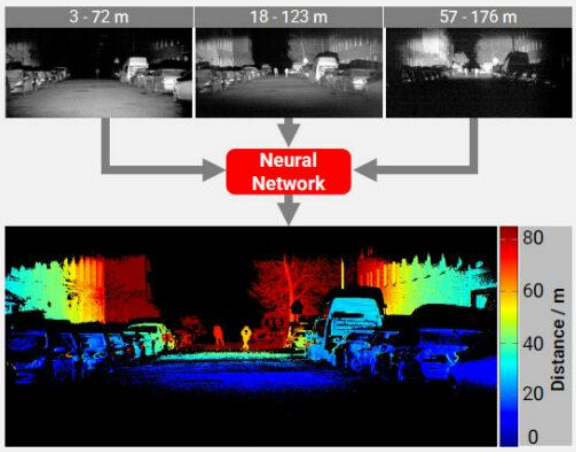
- A gated NIR CMOS imager integrated in VISDOM camera, generates an image with the right amount of illumination in every range without affecting other ranges and collects data from predetermined distances (slices) ahead of the vehicle while completely ignoring interferences along the way, such as rain, fog, mist, snow, and backscatter interference. When combined with the standard day camera already in every vehicle suite, the Gated Vision camera system fulfils the vehicle perception requirements to see clearly night and day, and in any weather.
- An illuminator technology based on a vertical cavity surface emitting laser (VCSEL) device that generates the required illumination power. For that it was necessary to develop a high-power VCSEL device that could pulse thousands of times per frame while being driven by a sophisticated laser driver.

These key components have been designed to comply with industry standards from the earliest design phase, in accordance with the relevant AECQ 100 or 102 and ISO26262 standards.

Aside from providing perfect images in any weather condition, detecting reflective objects, and providing distance estimates, gated imaging technology can also range the image using the inherent slice feature of the gated technology. By utilizing slicing techniques, the gated imaging camera system can provide high-quality images and an accurate depth map in any weather, day or night. The resulting image stream can be fed into any machine vision processing pipe and used in conjunction with detection algorithms with minimal effort and adjustments.

Bright Way Vision Gated cameras have been involved in the last AI-SEE project.

Images from the fog chamber at a visibility of about 50 meters



From three overlapping depth slice images of the gated camera a pixel wise depth map with an accuracy of 5% can be generated

AI-SEE is a PENTA EURIPIDES² funded project. PENTA and EURIPIDES² are Eureka Network Clusters, operated by AENEAS promoting the generation of innovative, industry driven, pre-competitive R&D projects around Smart Electronic Systems.

- Project duration: 43 months, 1st June 2021 – 31st December 2024
- Total costs: €20 million
- Funding from national public authorities (PENTA EURIPIDES²) label funding: €10 million
- Coordinator: Mercedes-Benz AG

- Partners: Mercedes-Benz AG, Patria Land Oy, Magna Sweden AB, Robert Bosch GmbH, **Brightway Vision Ltd**, TORC Europe, TORC Canada, Meluta Oy, Unikie Oy, VTT Technical Research Centre of Finland Ltd, ANSYS Germany GmbH, AVL List GmbH, University of Ulm - Institute of Applied Photonics and Optics, Fifty2 Technology GmbH, BASEMARK, Oy, ams-OSRAM AG, OQmented GmbH, University of Stuttgart - Institute of Semiconductor Engineering, Technical University Ingolstadt – CARISSMA, Institute of Automated Driving, AstaZero AB

AI-SEE Project scope:

To meet safety standards, Automated Driving Systems must, at a minimum, continuously assess weather and road conditions to determine when automated driving can safely operate. In cases where weather or visibility challenges become too severe, the system must promptly alert the driver to take control, ensuring safety while building trust in these advanced technologies. Recognizing the essential role of a safety-critical weather detection system, the AI-SEE project achieved progress in developing a robust multi layered perception system. By integrating high-resolution sensors, adaptive AI algorithms, and comprehensive simulation and testing environments, the project partners developed solutions that enable vehicles to navigate adverse conditions with improved resilience.

Combining hardware and AI advancements, the project focused on the following five objectives:

- High resolution adaptive all-weather sensor suite with novel sensors.
- AI platform for predictive detection of prevailing environmental conditions including signal enhancement and sensor adaptation.
- Smart Fusion to create a 24/365 adaptive all-weather robust perception system.
- Novel simulation path which realistically simulates adverse weather near the sensor to adapt and test the system on both real and artificially generated road scenes.
- System validation plan and driving test campaigns.

In particular, the driving testing campaigns in controlled environments and on public roads showcased the robustness of the AI-SEE all-weather multi-sensor perception system and its capability to operate in diverse lighting and weather conditions.

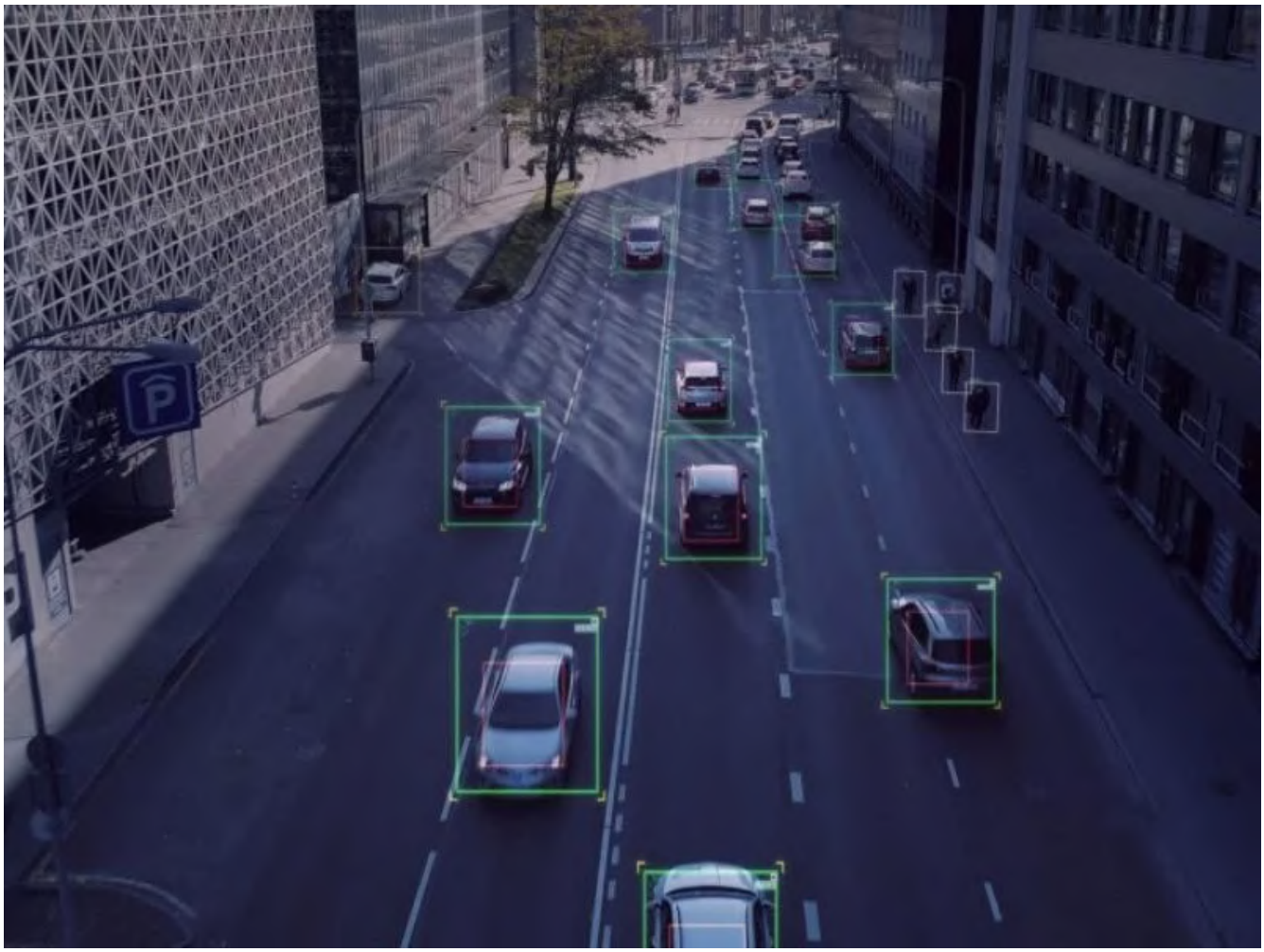
One of the key outcomes of the AI-SEE project is the novel sensing system's ability to detect and identify obstacles, including small hazards - up to 200 meters away, even in low visibility and adverse weather conditions. “This is a giant step towards SAE L3 market deployment, and enhances the safety of existing ADAS systems”, says AI-SEE Coordinator Dr. Werner Ritter, Mercedes-Benz AG.

The project’s key findings and results were showcased during the Final Event held at AstaZero, a project partner with the world’s first full-scale independent test environment for future road safety. The event featured high-level presentations from AI-SEE partners, an exhibition, and two live demonstrations that highlighted the project’s innovations.

DVN comments

Bright Way’s camera operates like a Flash Lidar but with over 2-megapixel resolution. It uses gated photodetectors and traditional deep learning algorithms for object detection, determining range by the closest slice where this object is detected. Due to the sensitivity of CMOS pixels and a brief exposure time, very high pulsed power is needed while maintaining globally class 1 eye safety to achieve adequate distance.

Stradvision showcased its SVNet 3D Perception Network at CES 2025



Stradvision in South Korea recently announced the use of the latest TDA4 silicon from Texas Instruments for a Level 2 domain controller and signed an agreement to run its software on AMD's FPGAs. The Stradvision SVNet 3D Perception Network still utilizes the TI TDA4VPE-Q1 system-on-a-chip (SoC) in a deep learning-powered ADAS and autonomous driving system.

This system supports various imaging solutions, **including Level 2 and Level 2+ ADAS, automatic valet parking, 3D surround view, and more, making it a versatile and cost-effective choice for future automotive applications.**

The TDA4VPE integrates advanced sensor fusion, edge AI, graphics, and video co-processing. It features 16 TOPS of AI performance, four ARM Cortex-A72 cores, optimized memory architecture, and a heterogeneous design for high efficiency while reducing system costs.

Using this chip, the SVNet 3D Perception Network **converts 2D camera data into accurate 3D environmental maps,** enabling vehicles to perceive their surroundings clearly. It supports high-level autonomous driving across various Operational Design Domains (ODD), including complex conditions.

The system is demonstrated at CES 2025 in Las Vegas, showcasing multi-camera inputs for advanced driver assistance systems (ADAS) like Level 2+ highway driving, auto valet parking, 3D surround view, and memory-based automatic parking.

The agreement with AMD marks the first instance of porting the 3D Perception SVNet onto the Versal AI Edge series devices. At CES 2025, Stradvision and AMD presented a joint technology demonstration with an 8MP front-facing camera using the AI inference engines in the FPGA.

“Our collaboration with AMD combines real-time processing technology with our SVnet advanced 3D perception network, setting new standards for performance, reliability, and scalability in automated driving systems,” said Philip Vidal, chief business officer of Stradvision.

“Stradvision is advancing autonomous vehicle technologies by making ADAS more accessible and affordable without sacrificing capability,” added Wayne Lyons, Senior Director of Marketing, Automotive Segment at AMD.

“We are collaborating with Texas Instruments to deliver cost-effective yet powerful solutions to the automotive industry,” Vidal stated. “The TDA4VPE-Q1 automotive SoC, paired with SVNet, exemplifies our commitment to advancing ADAS technologies. With production-ready software development concluding in 2025 and a Start of Production (SoP) targeted for 2026, we aim to meet market demands. This partnership also highlights our dedication to global expansion, addressing the increasing need for innovative and scalable solutions worldwide.”

“The TDA4VPE-Q1 automotive SoC for L2 domain controllers, featuring graphics, AI, and video co-processing, represents our vision of providing high-performance, flexible, and efficient solutions for next-generation automotive applications,” said Mike Pienovi, product line manager at Texas Instruments. “Our work with Stradvision and their SVNet software illustrates how technology can transition from 2D to 3D perception networks.”

Additionally, Stradvision has recently signed a master license agreement with Renesas Electronics to integrate the SVNet software with the R-Car system-on-chip platform as part of the Renesas RoX SDV development platform.

STRADVISION and its software have achieved TISAX’s AL3 standard for information security management, as well as being certified to the ISO 9001:2015 for Quality Management Systems and ISO 26262 for Automotive Functional Safety.

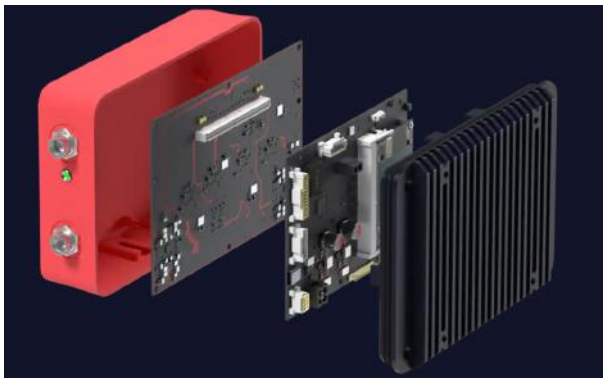
DVN comments

Founded in 2014, STRADVISION is an automotive industry pioneer in artificial intelligence-based vision perception technology for ADAS. STRADVISION’s SVNet is being deployed on various vehicle models in partnership with different OEMs in Germany and Japan. This company provides services for ADAS and autonomous vehicles globally and has a workforce of over 300 employees in Seoul, San Jose, Detroit, Tokyo, Shanghai, and Dusseldorf. STRADVISION will be participating in our upcoming DVN Workshop in Detroit on April 10, 2025.

RADAR TECHNOLOGY

Radar technologies News

Provizio demonstrated its single chip 4D Imaging radar in collaboration with Texas Instruments at CES 2025



Provizio has expanded its automotive portfolio with a software-defined antenna reference board using radar technology from Texas Instruments. Provizio aims to enhance mobility safety through affordable perception imaging radar that operates reliably in challenging weather conditions.

Provizio's software-defined antenna solution utilizes the AWR2944 radar sensor from Texas Instruments. This solution establishes new standards for imaging radar perception and safety systems in the automotive sector.

Central to this imaging radar system is the integration of Provizio's MIMSO® Software Defined Antenna Reference Design with Texas Instruments' single-chip 77GHz 4D Imaging Radar chip. This design converts **a single radar SoC into 48 virtual receiver channels**, achieving **sub 0.5° angular resolution** and enabling precise object detection and tracking, including pedestrians, cars, and trucks.

Powered by Provizio's MIMSO® and SPTDMA® technologies, the design delivers 20 times higher resolution from a single chip, addressing cost and performance challenges in high-performance radar systems.

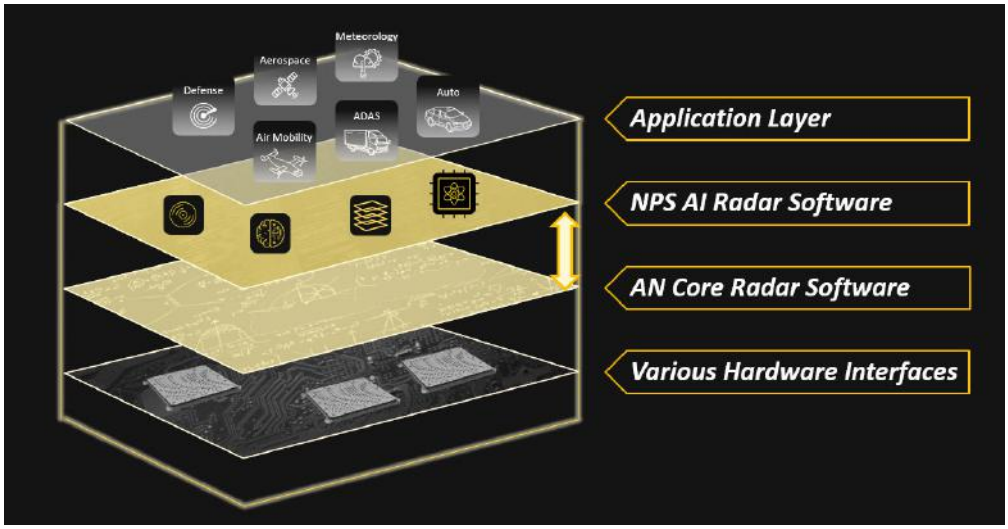
- MIMSO® is a software defined active antenna technique, which embeds proprietary surface-mount technology (SMT) integrated circuits (ICs) into a novel planar antenna design. This allows designers to lower the receive path noise floor and discriminate more of the radar beam by essentially recycling parts of the radar beams that have traditionally been filtered. On the transmit path, the SMT ICs allow to carry out instantaneous beam switching, which multiplies transmit channels and further increases resolution.
- SPTDMA® increases the number of tasks that can be performed simultaneously, by dynamically dividing and assigning radar hardware resources. When combined with MIMSO® Active Antenna, this technique enables improved efficiency, signal to noise ratio and, detection & tracking. SPTDMA also enables robust performance in all weather conditions, with the added benefit of protecting against interference from other sensors.

Transforming automotive safety and perception

This reference design is crucial for improving safety in automotive and industrial OEMs and Tier 1s. By offering precise, real-time detection and tracking of objects like pedestrians and vehicles, it helps vehicles respond to hazards, reducing accident risks and building trust in autonomous technology.

Barry Lunn, CEO & Co-Founder of Provizio, stated: "4D Imaging radar is essential for safer driving and advanced ADAS, but cost has hindered widespread adoption. Our collaboration with TI addresses these cost challenges."

NPS showcased its World's First AI-Powered Hyper-Definition Radar at CES 2025



NPS HROS in radar's architecture

On December, Neural Propulsion Systems (NPS), a pioneer in next-generation radar operating systems, announced the availability of its Hyper-Definition Radar Operating System (HROS™) for advanced driver assistance system (ADAS) providers. This hyper-definition, **AI-powered software-defined radar** solution is becoming essential for automakers that are racing to differentiate offerings and meet increasing consumer expectations for safety, convenience and performance at a reasonable cost.

With pedestrian fatalities in the U.S. having doubled since 2010 and new automotive safety mandates forthcoming, the auto industry is under increasing pressure to enhance road safety through ADAS technology. The National Highway Traffic Safety Administration (NHTSA) has set 2029 as the deadline for all new passenger vehicles and light trucks to include automatic emergency braking (AEB) systems capable of preventing collisions with other vehicles at 62 mph and pedestrians at 45 mph—thresholds that current AEB systems are not yet able to meet even in optimal driving conditions.

HROS leverages advanced mathematics, **AI, and patented algorithms on standard hardware** to deliver a solution that meets consumer and regulatory needs. It can differentiate a pedestrian next to a car at 150 meters in any weather or time of day, providing Crystal-Clear Visibility™ and accuracy. This enhances ADAS performance, even in low light, fog, and high speeds, where both camera and LiDAR sensors struggle.

Unlocking Crystal-Clear Visibility

“Our mission is to provide clear visibility for life-saving applications,” said Dr. Behrooz Rezvani, Founder and CEO of NPS. “Our HROS is a commitment to saving lives by setting a new standard for roadway safety. It uses advanced mathematics and AI to offer exceptional clarity and responsiveness, helping vehicles and robotaxis navigate complex roads reliably.”

HROS uses patented technology that allows vehicles to "see" better than humans and current systems. It delivers optimal radar performance with early hazard detection and fewer false positives, outperforming traditional radar technologies.

HROS is a practical and essential platform for diverse industries, including automotive, autonomous driving, aerospace, and defense systems.

HROS will be commercially available in Q1 of 2025.

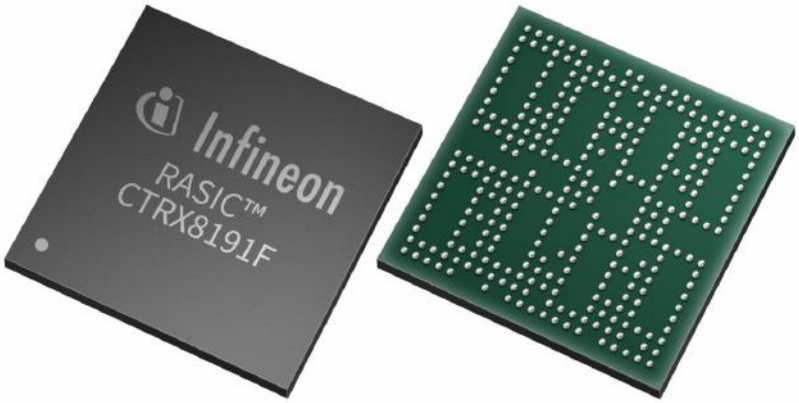
About Neural Propulsion Systems (NPS)

NPS is a leader in next-generation radar operating systems, offering exceptional visibility for critical applications. Its premier product, the Hyper-Definition Radar Operating System (HROS), represents an advanced radar solution that leverages AI-powered, patented mathematical frameworks to provide exceptional clarity and responsiveness. This innovative solution is available at a cost-effective price, making advanced applications practical and accessible for various industries. HROS is currently employed in automotive and defense sectors, where early detection and minimal false positives are crucial, ensuring users have confidence and awareness of their surroundings in any scenario.

DVN comments

Founded in 2018 by Silicon Valley experts, NPS develops advanced digital imaging radar technology. Their initial AtomicSense platform, was dedicated to develop radar algorithms on Graphic Processing Units (GPUs).

Infineon’s RASIC CTRX8191F radar MMIC targets radar imaging modules for automated and autonomous driving applications.



Targeting automated and autonomous driving requirements, Infineon Technologies AG has released the final samples of its 28-nm radar MMIC, the RASIC CTRX8191F. The radar sensor supports the development of next-generation radar imaging modules that meet the requirements of SAE-defined L2+ to L4 autonomous driving.

The CTRX8191F radar MMIC offers higher performance, and a better signal-to-noise ratio compared to previous generations. This is required to detect vulnerable road users and vehicles at up to 380 meters, using system configurations with eight transmitters and eight receivers, Infineon said.

The RASIC radar MMIC enables cascading of multiple devices at low frequencies, which reduces the need for expensive RF materials on the circuit board, and optimized launcher-on-package design also allows for the use of low-cost waveguide antennas, the company said. In addition, the digital PLL offers high flexibility in generating complex waveforms with the shortest flyback time on the market at <1 µs, according to the company.

Infineon also offers the CARKIT radar development kit to help with the design and deployment of radar systems. The dev kit is based on the CTRX8191F sensor prototyping module, which supports various system configurations, including the transmission of raw ADC data, FFT intermediate results or radar detections via a Gigabit Ethernet interface.

The CARKIT also includes example code, a graphical user interface and a waveguide antenna that can be replaced with a custom antenna to meet customer requirements. Several versions of CARKIT are available, including a 4D front radar configuration with eight transmitters and eight receivers, and a corner/front radar solution for the standard market with four transmitters and four receivers. Samples of the CTRX8191F radar MMIC and CARKIT modules in various configurations are available now.

DVN comments

Infineon has been providing automotive radar sensor solutions, for many years. In 2008, an Infineon chip was still named RASIC (Radar System IC) and used in Bosch’s new 77GHz LRR3 radar sensor system (third generation long range radar). The range of radar transceiver MMICs (RASIC™) meets now the requirements of 77/79 GHz radar for safety-critical applications, such as automatic emergency braking (AEB) and high-resolution radars in automated driving. These sensors support precise distance measurement and simultaneous transmitter operation for MIMO.

SENSING ARCHITECTURES

Sensing Architectures / Integration News

Mobileye CEO Presentation “Now. Next. Beyond” / Amnon Shashua @ CES 2025

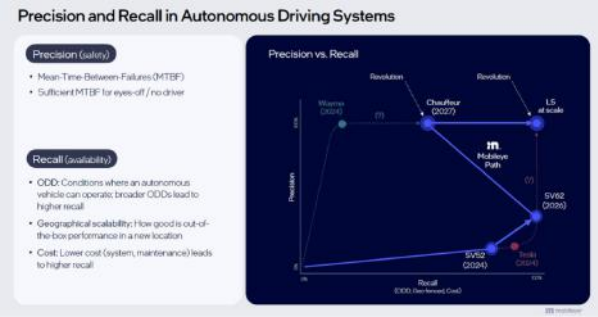
The presentation highlights Mobileye's future projections and strategies while cautioning about the uncertainties and risks involved.

Revolutionizing Transportation:

There are two main strategies for developing AD vehicles, both aiming for AD L5.

- The first path followed by Waymo was to achieve very soon (before 2024) about 100% of precision (that means a high MTBF for “eyes-off” or “no driver” AD systems), but in a same time a reduced Recall (low ODD conditions, specific geographic locations, and high costs on sensing and computing systems).
- As a second path, Tesla initially focused on higher Recall over lower Precision (MTBF between 5 to10 hours) because covering in same time wider ODDs and lower production costs. Their vehicles are particularly deployed with AD L2 and AD L2+ levels.

Mobileye is following a similar path than Tesla with its SV52 supervision system which has reached more than 300.000 units in China since 2021 with EyeQ5 and is continuing to grow in Europe and US with Polestar. In 2026, SV62 will enhance the supervision system’s precision on future Porsche (development leader), Audi, and Volkswagen models with EyeQ6-H, enabling AD L2+ capabilities.



Mobileye's Chauffeur system (SV63), led by Audi will launch in 2027. It will achieve an “Eyes-Off” level with the highest precision, by a consequent enhancement of its sensing system (originally based on two EyeQ6 Cameras), with an additional EyeQ6, corner imaging Radars and Lidars. Despite this highest Precision given by a richer sensing system, costs will not be sacrificed. Costs will be optimized by a reduction of ODD to highways. **All driving situations on highways will be covered up to 130 km/h.**

But to achieve comprehensive “Eyes-Off” capabilities, scaling geographically might present numerous edge cases that fall outside the current distribution.

For Mobileye, two approaches could facilitate this generalization and Recall level:

- Collect exhaustive data in diverse situations
- And/or inject abstractions that transforms “out-of-distribution” and edge-cases to typical, in-distribution, case.

Mobileye design principles are currently based on:

- Leveraging ADAS data (285 Petabytes currently) collected over 20 years.
- REM (56.6 billion miles harvested) through crowdsources technics
- Using redundant systems where each relies on a different abstraction

The Five Pillars considered by Mobileye:

1/Safety:

Self-driving system with Human-level MTBF is not sufficient because humans are expected to properly respond to events even when those are extremely rare (e.g., baby lying on the road). Human driving statistics are heavily influenced by illegal or irresponsible behaviours (e.g., driving under the influence, texting while driving).

For Mobileye, Self-driving system safety goals must be:

- Absence of “unreasonable risks”, with a transparent definition of the boundary between reasonable and “unreasonable risks”.
- The overall MTBF of the system should be better than human statistics.

Mobileye's Safety Architecture addresses four types of errors, with four methodologies to manage it:

- **Planning Errors:** due to mis-interpreting the intentions of other road usersandHuman planning errors (lapse of judgement).
  ==> ***RSS*** *(Responsibility-Sensitive Safety): is a technology neutral safety model for errors predictions. RSS adheres to five safety rules: Safe distance, cutting-in, right of way, limited visibility and avoid crashes.*
- **Identifiable Errors** likeHardware failures (e.g. a sensor malfunctions)or Software bugs (e.g., memory corruption).

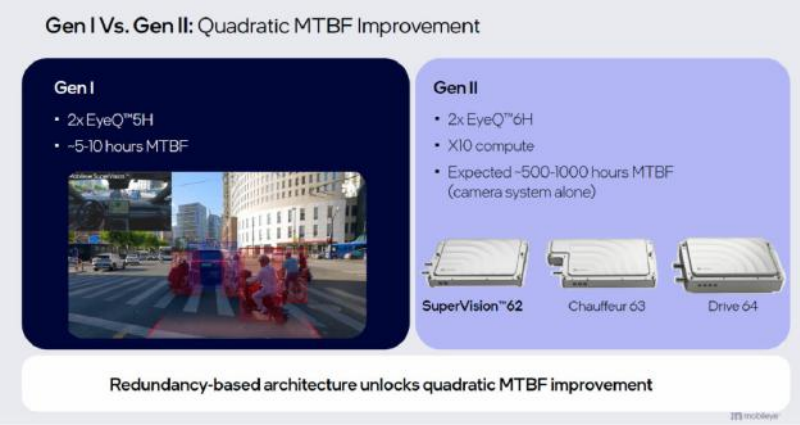
==> ***Fusa*** *(Functional Safety):Defined by ISO 26262,its goal is to reduce the risk associated with a product's failure as much as possible using safety systems that are designed to detect any potential hazards and then take corrective action if necessary. Redundancy is one of solutions.*

- **Reproducible Errors** whenthe system fails, without understanding that it fails (but when it is easy to reproduce the error in a test track) or "Unreasonable risk" (e.g. Baby lying on the road)or"Reasonable risk" (2 flat tires simultaneously).
  ==> ***Eliminate 'unreasonable'*** *is realised through SOTIF method (Safety of the intended functionality) defined by ISO 21448.*
- **Black Swans** or rare errors corresponding with unexpected failures that cannot be easily predicted or reproduced like "**AI bugs**".
  ==> ***Redundancies through PGF (****Primary Guardian Fallback) is a Mobileye's methodology leveraging redundancies so that failure involves at least two sub-systems With three different sensors (Camera, Radar, Lidar) covering the same field of view, two options can be considered:*
  - *Worst case approach: If any of the sensors requests a braking operation, we should brake. The probability of unnecessary braking increases by a factor of 3*

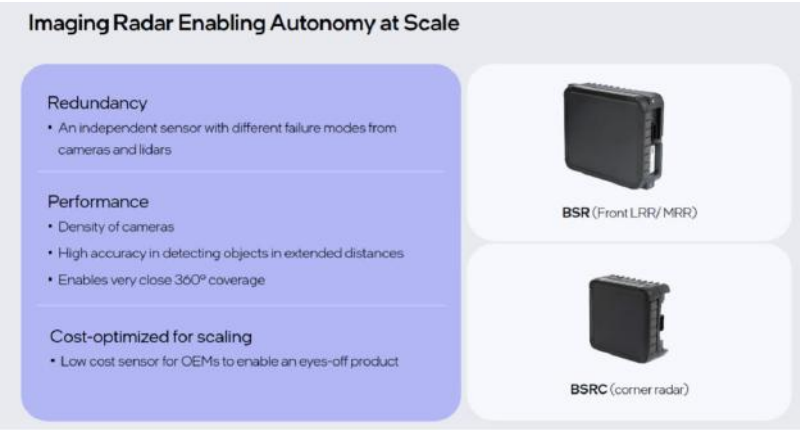
Either option compromises comfort in favour of safety or it does not cover non-binary decisions.

2/Technology Stack:

Leveraging CAIS (Compound AI Systems) architecture, EyeQ™6H, and BSR imaging radar will enhance autonomous capabilities.



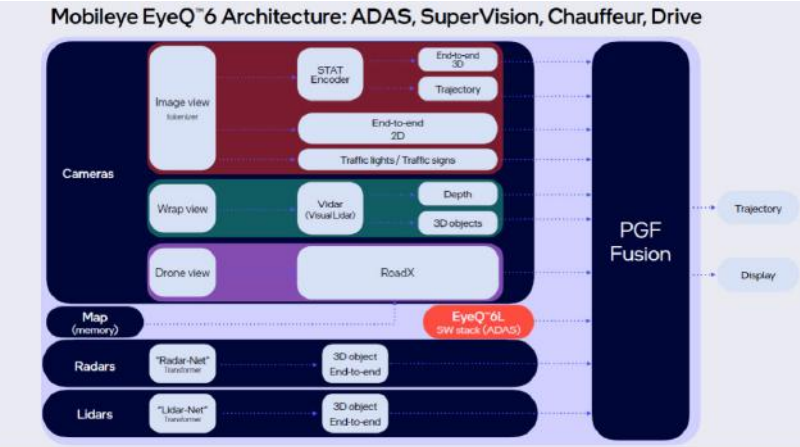
EyeQ™6H boasts three times the compute power of the preceding EyeQ5H chip yet consumes just 25% more power. With such a dramatic increase in its performance-to-consumption ratio, our newest premium ADAS chip can support even more advanced driver-assistance features than its predecessor. But EyeQ6H doesn't just do better than previous iterations of EyeQx – it also does more.



BSR Imaging Radar: Mobileye's advancements in imaging radar technology, emphasizing redundancy, performance, and cost optimization. BSR's precise detection enables the system to discern objects in unique scenarios, such as stationary vehicles under a bridge. It generates a rich point cloud that facilitates AV driving capabilities such as exact lane assignment and the ability to react quickly at high speeds.

BSR imaging radar complies with OEMs requirements (minimum distance 130m) on specific targets.

Object	Position	Distance Range
Child dummy	Between 2 cars (3m between cars)	240m (maximum test distance)
Adult dummy	Between 2 cars (3m between cars)	240m (maximum test distance)
Lying dummy	Facing vehicle direction (open space)	181m-214m
Lying dummy	Facing vehicle direction (near guard rail)	136m-143m
Wooden palette	90 degrees to vehicle	240m (maximum test distance)
Wooden palette	45 degrees to vehicle	202m-206m
Small Piece of wood	Facing vehicle direction (open space)	136m-142m
Small Piece of wood	Facing vehicle direction (near guard rail)	220m-222m
Wheel Rim	Open space	226m-229m
....		



The internal Mobileye's EyeQ6 architecture dedicated to Supervision, Chauffeur and Drive AD versions, is based on Safety Architecture. Aiming to eliminate unreasonable risks through redundant systems and transparent boundaries between reasonable and unreasonable risks. Different integrated subfunctions assume 2D, 3D object's tracking by each sensing technology, Road mapping, road objects like traffic lights/signs. These objects and contexts (mapping) are injected into the PFG Fusion block. This block ensures reliable decision-making by using multiple subsystems to validate sensor data.

3/Scalability:

Scalability is offered by the ability of an autonomous system to expand its ODD (road types, weather conditions, speed limit, etc.) over time.

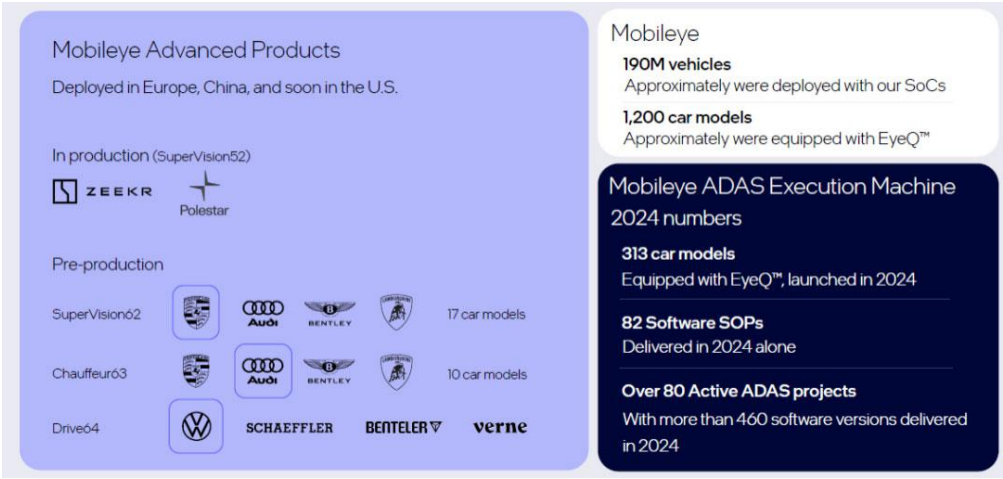
Mobileye plans to expand ODD with Chauffeur supervision, starting with highways, ramps, and speeds up to 130 km/h. They will gradually enhance ODDs by adding for redundancy:

- 4 surround imaging radars
- 4xEyeQ™6H or 2xEyeQ™7H for computing.

Both add up to a marginal cost increase.

4/Productization:

Transitioning from demo to real product by meeting industry standards and collaborating with OEMs.



The path to productization presents significant challenges

- Geographic scalability:
  - More than 50 OEMs using Mobileye systems
  - REM covers over 95% of the roads in the US and EU
  - Over 285PB of ‘full video’ clips worldwide
- Multiple car models and OEMs: Support spectrum of requirements and sensors
  - DXP - allows the OEM to code and control unique elements in the system affecting the driving experience
  - Modular AI stack (CAIS) Facilitates the development process to adapt to changes of sensors and their placement on the vehicle
- Meeting industry standards: Automotive grade, FuSa, SOTIF
  - Proven experience as an ADAS supplier - Over 50 OEMs, 1,200 car models, and shipping more than 190M EyeQ™ chips
  - Successfully deployed Supervision (SV52, SV62) in both China and Europe
  - Transparent safety architecture

4/Costs:

The costs of SV62 ($2000-$2500) for AD L2,L2+ could be doubled for AD L3 with CH63 ($4500-$6000)

Mobileye Vision to Revolutionize Transportation

Moving from Hands-on / Eyes-on to Hands-off / Eyes-off and No-driver

ADAS

EYES-ON / HANDS-ON

Front Camera (1V)

- Driver Assist safety features
- Cloud Enhancement with REM

Surround ADAS (6V5R)

- ENCAP 2028+ 5 Star
- Hands Off on Highways

$700-$800

1xEQ6H (2026)

SuperVision

HANDS-OFF / EYES-ON

Surround Camera (optional radar)

- SuperVision62 enables "Vision Zero" Asymptotic Safety level for ADAS
- Hands Off, point-to-point navigation
- Personalized Driving Flavor, learning from the user

SV62 (2026)

$2000-$2500

SV71

$1200-$1900

Chauffeur

EYES-OFF

Surround Camera + Imaging Radar + Lidar

- Giving back time to the driver.
- Overall MTBF designed to be better than human statistics

CH63 (2027)

$4500-$6000

CH72

$4000-$5000

Drive

NO DRIVER IN THE CAR

Surround Camera + Imaging Radar + long-range Lidars

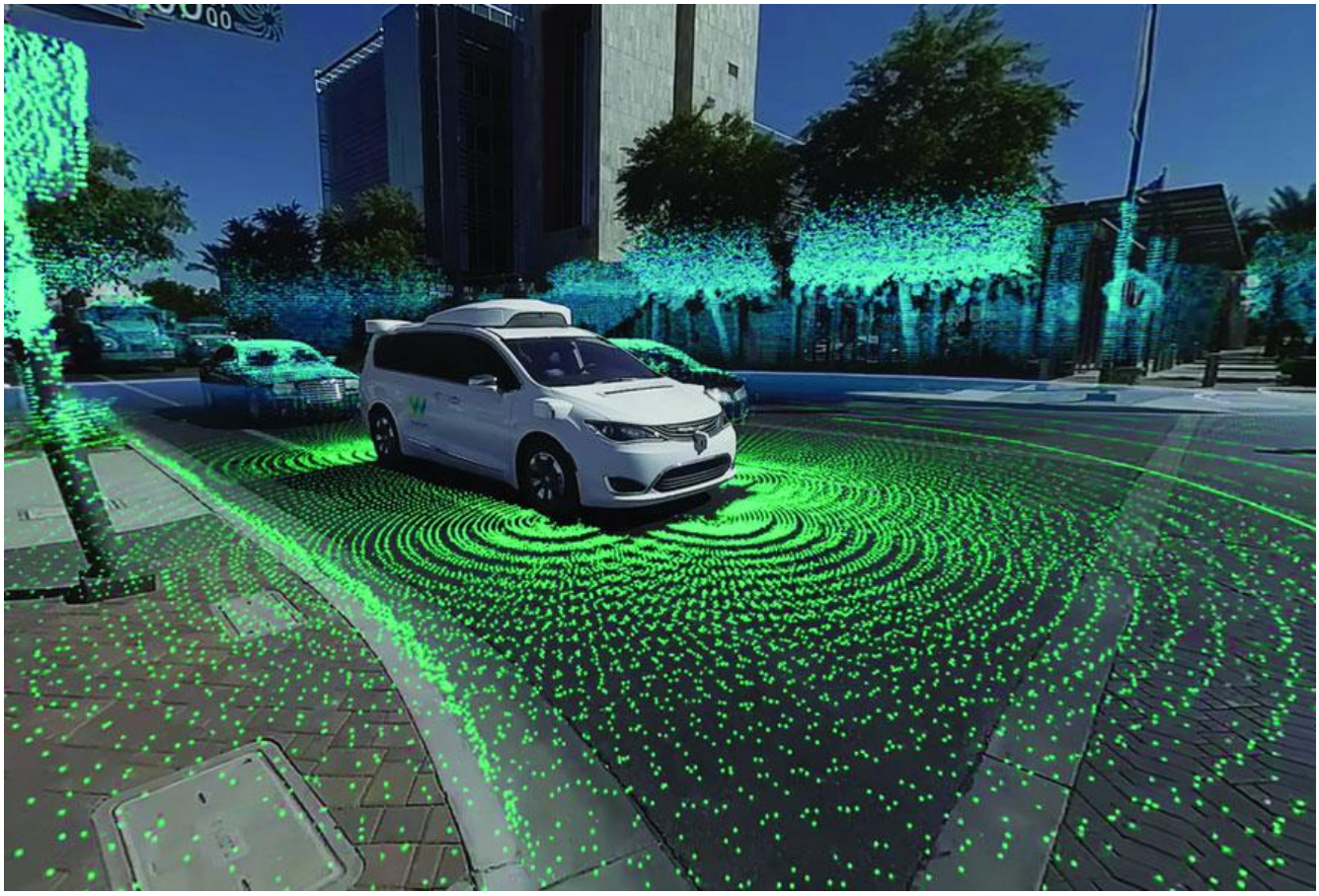
- Driverless Robotaxi
- Cutting YY% of average $/mile

DR64 (2027)

DR72 (2029)

WORKSHOPS & CONFERENCES

Next DVN event: AEB Workshop FMVSS127 (10.Apr in Detroit)



The following companies are already confirmed as speakers or said they will join (OEMs: participants expected from Lighting and ADAS teams):

Session 1: Stellantis, Ford, Valeo + GM, Mobileye-tbc, Mercedes, Zoox, Magna, Bosch as visitors + NTHSA, Scout-tbc
Session 2: Forvia/Hella, Aptiv, Perciv.ai, Zendar
Session 3: Adasky, Flir/Teledyne, Robosense, Light-IC, Cepton/Koito
Session 4: Ansys
Exhibitors*: Valeo, Omnivision, Light-IC, Flir/Teledyne + Adasky, Ansys-tbc

(*) demo-vehicle or booth

09th April (Welcome Dinner)

Welcome Cocktail	18:00
Standing Dinner on Exhibition Platform	19:30

10th April (AEB Workshop FMVSS 127)

Opening	08:00

Session 1: NHTSA Requirements vs Current Technologies

Keynote(s) NHTSA Requirements	08:15
Performance of Vision Systems Improved Performance of Lighting Systems Improved Performance of Vision Systems	08:50
Q&A: Opportunities for Vision Systems	10:05
Coffee Break	10:20
Performance of High-Definition Radars Performance of Fusion Systems	10:50
PANEL-1: Benefits of the Fusion Systems	12:20
Lunch Break on Exhibition Platform	12:45

Session 2: NHTSA Requirements vs New Technologies

Performance of IR Cameras Performance of Lidars	14:10
Q&A: Benefits of the New Technologies	15:40
Coffee Break	15:55
Performance validation & simulation	16:25
PANEL-2: Sensing Architectures and Validation Schedule	16:55
Closing Remarks	17:15