DVN “Special Report” - CES ADAS Report / January 2025

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CES kicked off the technology year again in Las Vegas. This report is a quick summary of the latest ADAS related news from the show.

Software defined vehicles were a big theme at CES this year, as OEMs look to move from hardware centric upgrades to OTA software upgrades in the future. In order to do this OEMs must move to more generic multi-purpose hardware platforms, like the Valeo or LG solutions we discuss below or TI’s “zonal architecture”, which also has the benefits of reducing wiring harness complexity/weight and network delays. Some ADAS and IVI functions start to run on the same compute platform in this sort of architecture, and new features can easily be added over time.

VALEO - had a number of demo vehicles in the parking lot, and a comprehensive display of SDV technologies. Highlights included a scalable FMVSS127 solution – with up to 4x corner radars, VGA thermal camera and front camera. While they can pass the new standards with a camera only system it depends on the exact configuration of the vehicle (for example, a high hood-line SUV poses challenges) and there maybe tradeoffs in false positives and braking smoothness. They also have a single box L2+ solution (VSS360) using Mobileye (EQ6) plus Renesas + ASIC (for ultrasound) compute.

For Software Defined vehicles, Valeo showed a cloud based development suite, that can go from natural language inputs to code generation to reconfigure the dash-board UI (for example), test the system on a digital twin and then remotely push the code to actual hardware for HIL testing. As more OEMs move towards central compute platforms, it

becomes possible to manage ADAS and IVI on a single piece of hardware and Valeo showed a Qualcomm based system capable of doing this.

Valeo VSS360 demo vehicle: Source Valeo

QUALCOMM - I spoke to Rajat Sagar, VP of the Automotive BU at Qualcomm who briefed me on the latest trends in automotive compute. There is a growing convergence of ADAS and IVI into a single ECU, as we saw at Valeo and LG, which can be done with the latest Snapdragon Ride Flex SoC. This is possible with a combination of software (virtualization) and hardware features. Full ASIL-D can be achieved with an integrated safety-island. Qualcomm acquired the Arriver ADAS/AD software stack from Veoneer in 2022 and has since worked to optimize for its SoCs. BMW is a lead partner and will bring this to market on the Neue Klasse EVs in 2025. As more compute power becomes available, more ODD's and corner cases can be handled by the AD system, allowing for a better driving experience.


BMW Neue Klasse

MAGNA – Tom Herbert, Director of Product Management told me Magna is moving to more of a total system focus, including central compute. As more sensors are added, not just perception, but fusion becomes important. Magna has a partnership with Flir for thermal cameras and is also working with others in this space. Imaging radar is getting better and finding applications in L2+ systems. Lidar has become less of a focus for Magna in the last couple of years.

Mobileye - was showing the new Eyeq6 processor in a number of applications. The Mobileye solution is scalable from L2+ platforms all the way to Robotaxi (Mobileye Drive) by increasing the sensor set and number of processors. A basic system can run on a single CPU, and the full L4 system uses 4 processors. The VW ID.Buzz based Robotaxi was on display with 9 lidars (Innoviz), 13 cameras (11 plus one redundant and one for traffic light recognition) and 5 imaging radars. This rolls out in 2026 as a service. Holon was also showing a shuttle vehicle based on a similar system. The increased performance of the EQ6 allows for better driving performance (time between disconnects). Imaging radar continues to improve – with resolutions of less than 0.3° that allows (for example) a VRU to be detected at 240m with as close as 1m of separation, and a palette next to a guard rail to be detected at 180m.

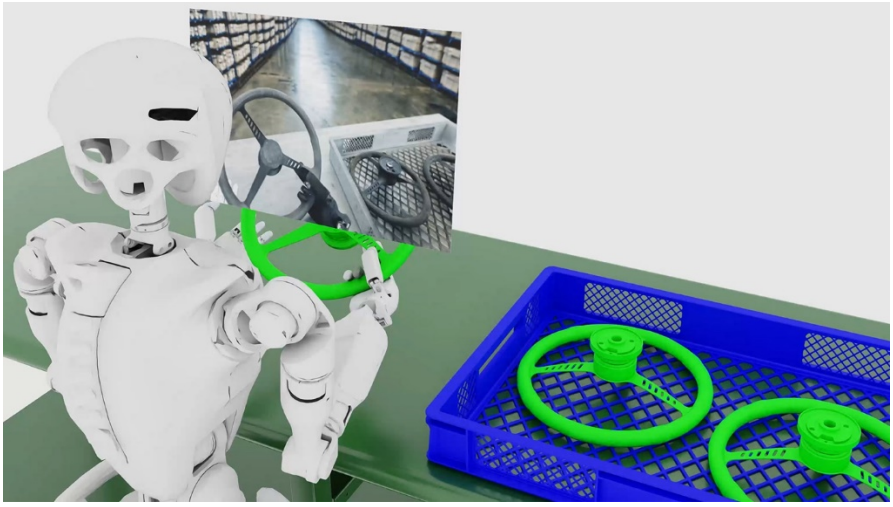
Hailo - is a smaller AI processor vendor and had a demo suite off the show floor. Raspberry Pi has released a low cost Hailo Compute board and SDK that allows it to be integrated into robotics and other applications. TTControl has developed an off-road ECU based on a Freescale iMX.8 plus Hailo H8 accelerator. Hailo was showing a number of other automative related demos with Tier IV, Perciv, Renesas and iMotion.

Hailo-based TTControl ECU

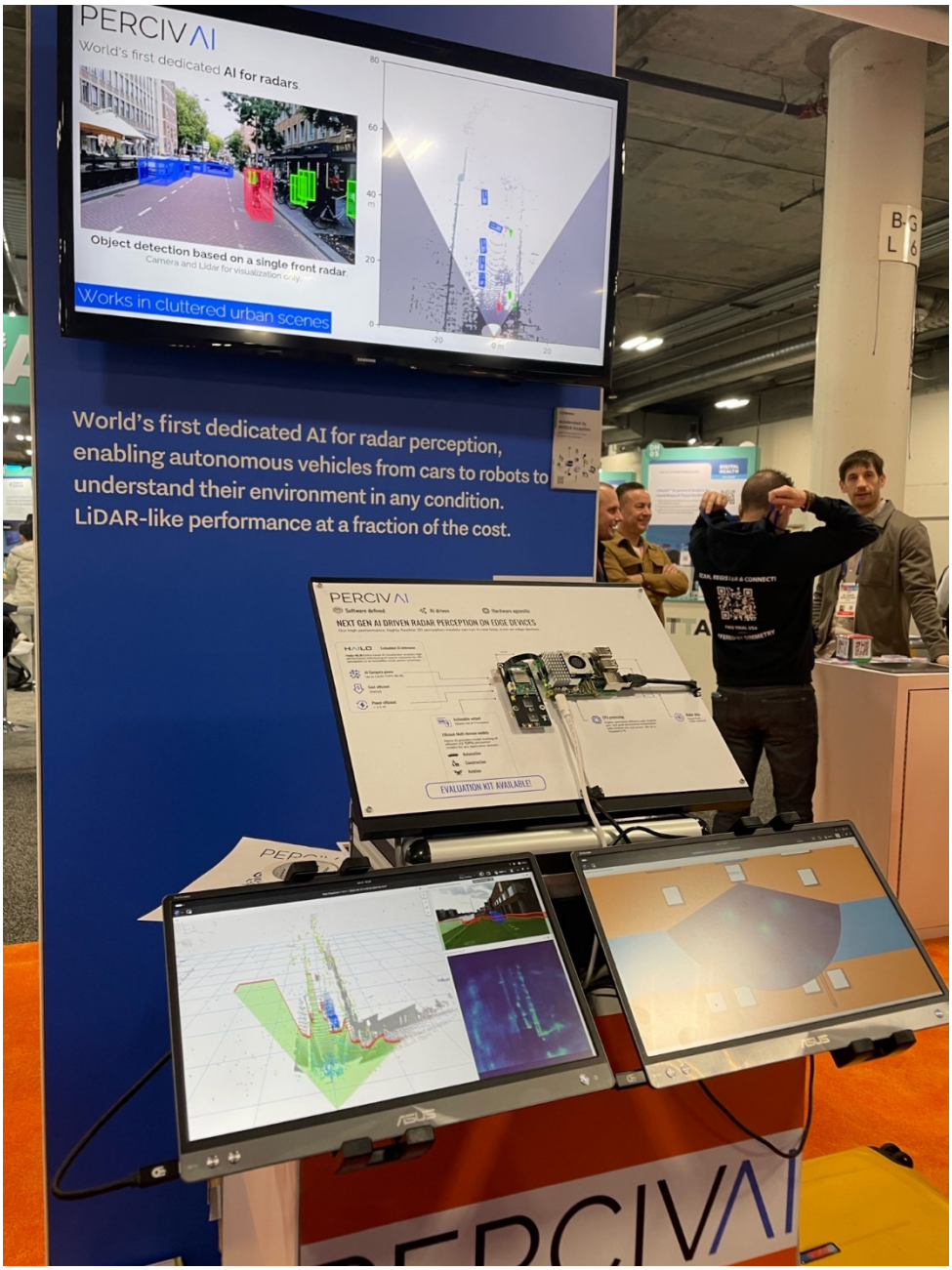
APTIV - was showing its latest Gen6 ADAS Platform that includes hands-off urban pilot and a perception solution that includes a birds-eye camera with short-range radar to eliminate blind-spots.

Stradvision - was showing its latest perception solution running on TI's TDA4 processor for L2 applications including valet parking and 3D surround view. The Stradvision stack also runs on AMD's Versal™ SoC and Renesas's R-CarV4H platform giving OEMs and Tier1's a choice of hardware solutions. Over 2M vehicles are already on the road using the Stradvision software.

Nvidia's primary automotive news centered around its COMOS platform, which is a foundational model for developing physical AI, including robotics and autonomous driving. The foundational model allows for large amounts of synthetic data to be generated that can be used to train your driving models, reducing the need for collecting real-world data which is one of the biggest costs in AI development.



Perciv AI – was showing a radar perception stack – which can also be fused with camera data for a “Lidar-like” performance. They were using ZF and Smart Micro Radar for their demo running on a Hailo 8 processor (13 TOPS performance) – and can run some functions just on an ARM CPU. The software is hardware agnostic – and can run on sensor or zonal compute – or on a larger central compute platform.



Carteav – was showing an autonomous shuttle demo – running live from Florida – using a golf-cart type vehicle – equipped with short-range radars, Robosense Lidar and cameras.

They also have a “uber-like” app to book a ride. The primary application is to serve private communities or other fenced in areas where a low speed vehicle like this are appropriate.

Waymo – was showing their 6th generation Robotaxi – based on a Zeeker minivan. Reducing cost of the hardware was a primary goal – so front and rear lidars have been removed (the corner lidars now cover a wider field of view) and the system has HD Radar. Another improvement was to “weatherize” the sensors better – and you can see wiper blades on the cameras now. These cars are already testing in San Francisco and other markets.

Waymo 6th Generation Zeeker Van

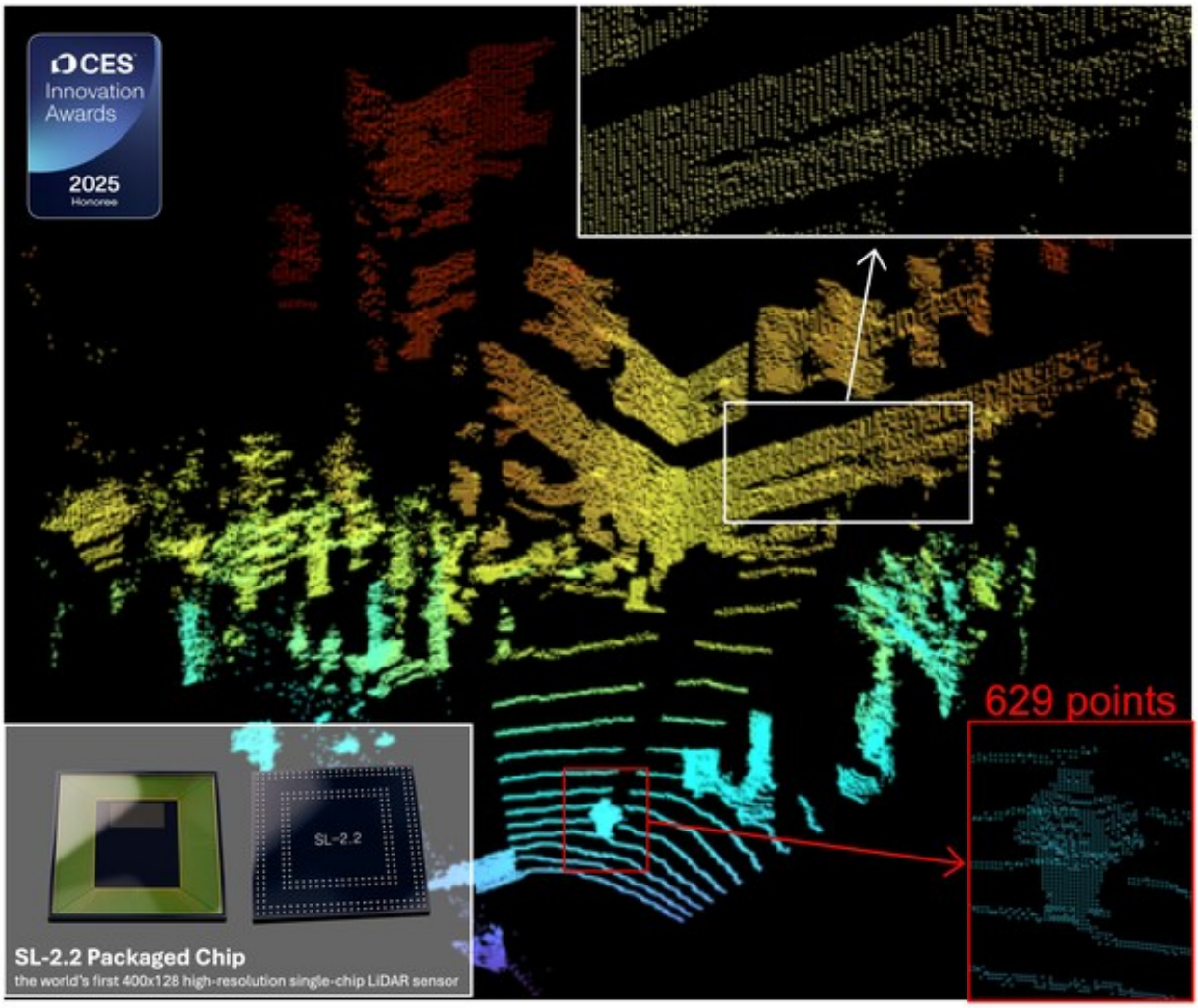
LG Innotek was showing solutions for autonomous driving, including its own Lidar unit that is soon to be available. LG is showing a central compute platform based on Qualcomm's Snapdragon Ride SoC and software that also integrates LG's IVI and ADAS capabilities.

LG Innotek Lidar

Zoox had a demo vehicle on display – the vehicle uses 14-18 cameras, 4 corner lidars and radar. Testing has already begun in San Francisco and Las Vegas and public service should roll out later this year.

Smart Radar. Is using the Nextchip Soc for radar signal processing and achieving close to 1° resolution – so not quite as good as the Mobileye demo, but an alternative using off-the shelf components to look at.
The LiDAR vendors were quite well represented in the West Hall, including Seyond, Innoviz, Koito/Cepton, Hesai , Solid-Vue and others.

Solid-Vue was showing its SL2.2 lidar chip offering 400x128 resolution. The device is CMOS based and allows a totally solid-state lidar.

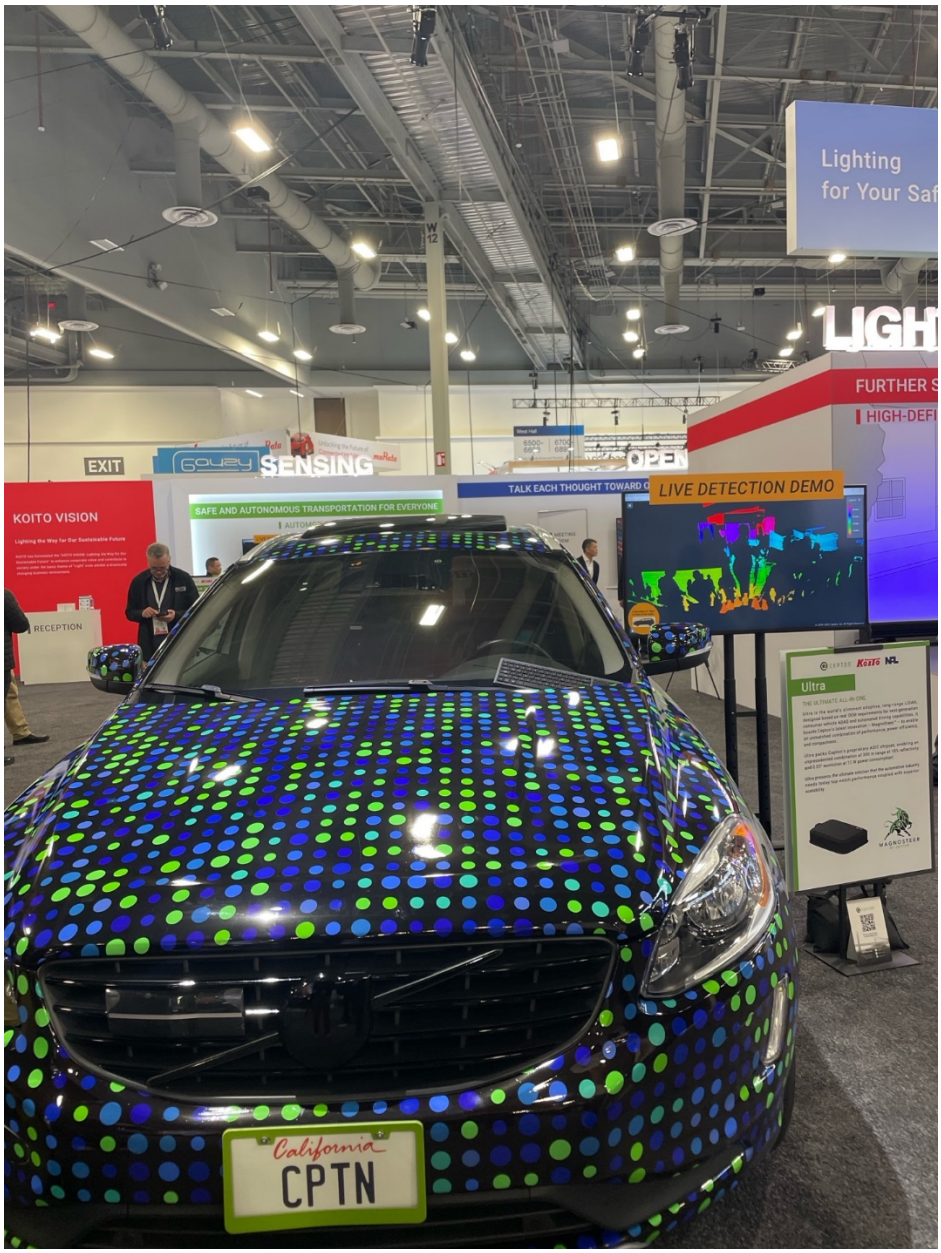


AGC/Wideye was showing lidar integration solutions with Luminar and Hesai and is also working with Aeva. There are a few innovation cleaning options, including nozzles at the side of the lidar "bump" and a nozzle at the top of the wiper arm that can spray at the right position to clean the glass.


Glass Solutions for 360°
Every Breakthrough
AGC
Glass trim
Integration of Luminar High-LiDAR into a unique shaped glass roof
Luminar
We would like to thank our great partners
HESAI
LUMINAR

Seyond has developed its own ASIC to reduce the cost of its high-performance Falcon K lidar. They also have cost reduced units (Robin series) that can be used for side lidar applications including blindspot monitoring. I asked Yang Han why this was a better solution that radar – and he told me that for level 3 systems and even L2+, it still has much better resolution and less false positives. Nio is one of the first OEMs to use that.

Koito/NAL/Cepton were showing behind windshield lidar demo and a cool HD-adaptive beam lighting demo that can be controlled by the ADAS system to enhance nighttime detection performance.

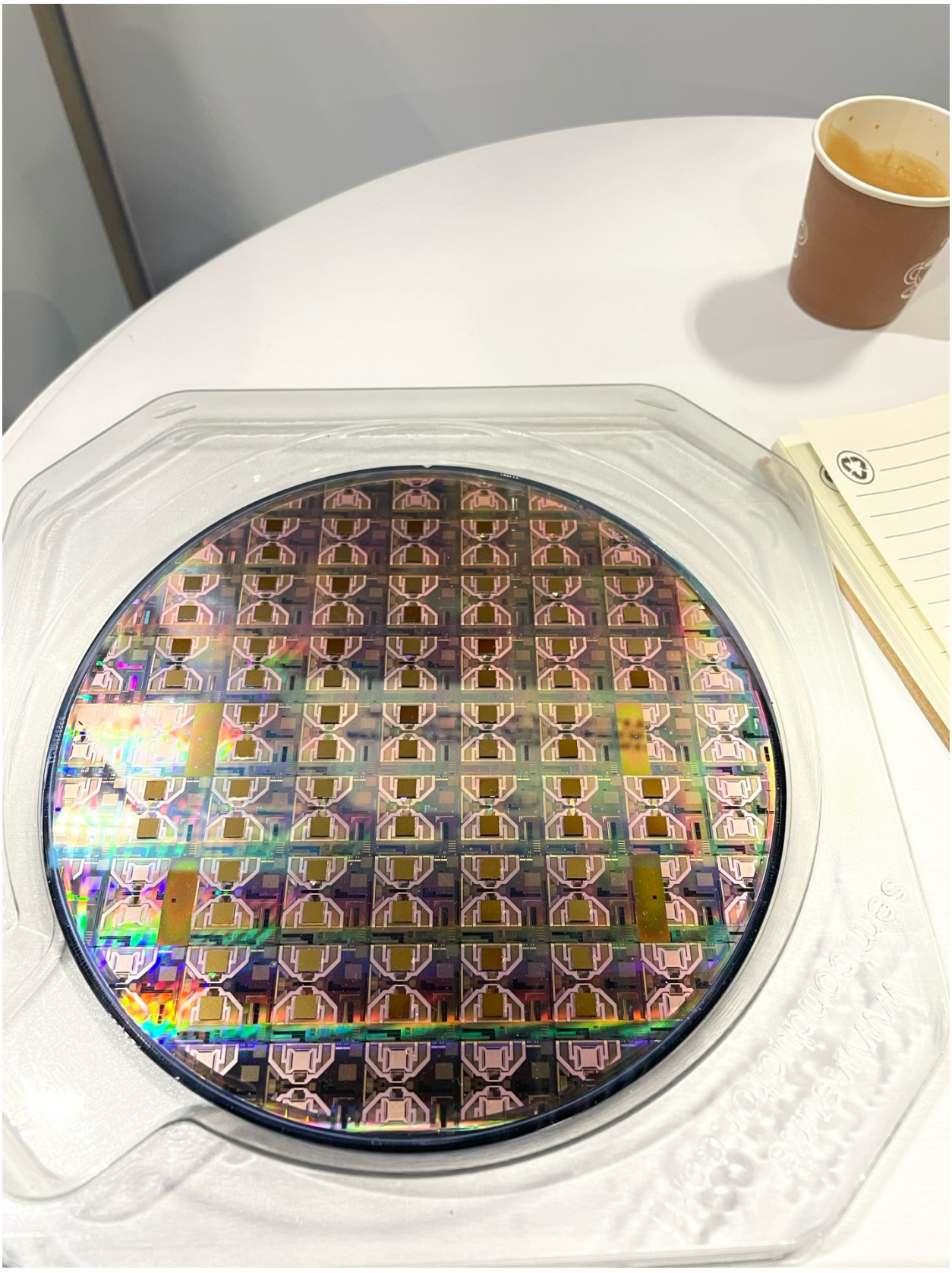


Leddar tech has moved from being a lidar technology supplier to a software vendor, with a perception and early fusion (Radar) solution that was running on an TI demo platform. Early fusion can double the detection range and result in less false positives and they are working on a number of truck and vehicle programs for this technology. China OEMs are targeting a based cost of $300 for the whole L2 system, including sensors, compute and software.

Innoviz was showing their first generation integration on a BMW i7 and the Innoviz Two on the VW ID.Buzz platform they are developing with VW and Mobileye. BMW integrates the lidar in the grille, and has a spray based cleaning solution on the side of the cover. The VW uses 3 roof, 4 corner and 2 side lidars that can achieve a resolution of down to 0.05x0.05 and produce a clean point cloud, even with a partially blocked cover. The lidar processing is done by a Renesas R-Car SoC, fusion is done separately. 905nm still offers the best cost/performance tradeoffs according to Christian Bornhoeft (VP Sales). They continue to look at 1550nm and FMCW but that is not ready for primetime yet.

Aeva introduced a new slimline FMCW LIDAR, the Atlas Ultra, with production in 2026 and was showing a behind the windshield integration with AGC Wideye. Resolution has increased 3x versus the previous model and the Ultra is full-automotive grade, with passive cooling, using Aeva's own silicon.

Steerlight's CEO (Francois Simoens) showed me their first SOI wafer that includes OPA and Wave Guides on the substrate. The add a flip chip controller to build a full solid-state lidar. The initial applications will be industrial 2-D solutions with prototypes this year and production in 2026.



In Summary – ADAS has become mainstream and an increasing set of features are being added. Camera based systems are great for L2/L2+ driving, but radar and lidar will become more important as we move to L3 and beyond. Robotaxi services are starting to take off and as hardware costs are reduced we will see many more deployments. Many OEMs are moving to central compute solutions and as increasing amounts of compute power become available additional ODDs can be addressed and driving will become smoother.