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Automotive Vision Industry Report, 2024

Dec. 2024

Automotive Vision Research: 90 million cameras are installed annually, and vision-only solutions lower the threshold for intelligent driving

The cameras installed in new vehicles in China will hit 90 million units in 2024.

From January to September 2024, China installed 64.213 million cameras in new vehicles, surging by 32.6% from the prior-year period. including:

- 11.574 million front-view cameras, up 26%;
- 6.997 million side-view ADS cameras, up 81.9%;
- 1.246 million rear-view ADS cameras, up 152.9%;
- 30.278 million surround-view cameras, up 33.2%.

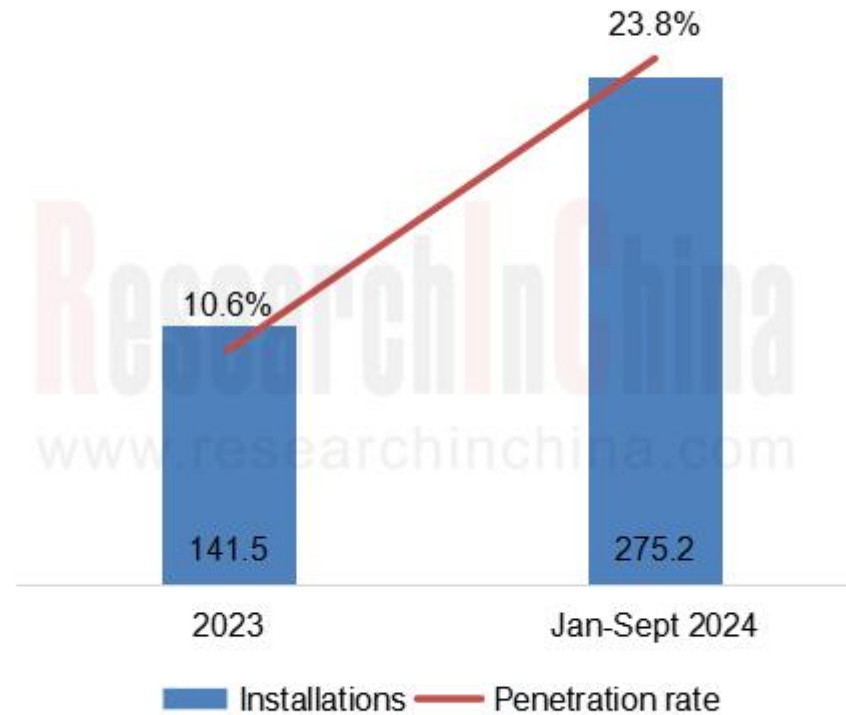
According to the camera installations and like-on-like growth in the first three quarters, ResearchInChina predicts that 90 million cameras will be installed in new passenger cars in China in the whole of 2024.

From the perspective of camera resolution, front-view and side-view cameras still tend to have high resolution; increasing 8MP cameras are installed, from January to September 2024:

- There were 2.752 million 8MP front-view cameras installed, up by 26% compared with the same period of the previous year, with the penetration rate jumping from 10.6% to 23.8%;
- There were 1.683 million 8MP side-view ADS cameras installed, a spike of 67.2%;
- There were 297,000 8MP rear-view ADS cameras installed, soaring by 116.1%.

Installations and Penetration Rate of 8MP Front-view Cameras

Installations and Penetration Rate of 8MP Front-view Cameras in Passenger Cars, 2023-2024 (10,000 Units/%)



Source: ResearchInChina

Installations of Intelligent Driving Sensor Solutions and YoY Change

Vision-only high-level intelligent driving solutions are available to models priced at RMB100,000-200,000

In terms of ADS sensors installed in new vehicles, the 7VnR solution enjoyed big growth in 2024:

- 389,000 vehicles were fitted with 7V from January to September;
- 7V3R1L skyrocketed by 4755.1% on the previous year;
- 7V1R1L surged by 101.0%;
- 7V5R1L soared by 173.4%.

Note: The year-on-year decline of the "7V1R" solution in the table is mainly due to Tesla.

The 7VnR solution continued to iterate in 2024. PhiGent Robotics lowered the price of the 7VnR solution to less than RMB4,000. Zhuoyu introduced two-stage end-to-end technology (based on 7V+32TOPS hardware configuration) to the 7VnR solution for the Chengxing Platform.

Installations of Intelligent Driving Sensor Solutions and YoY Change, Jan-Sept 2024

Intelligent driving sensor solutions (only solutions with visual sensors are listed)		Installations in 2023 (10,000 vehicles)	Installations in Jan-Sept 2024 (10,000 vehicles)	YoY change
1V	1V	121.8	88.1	0.7%
	1V1R	412.3	320.8	14.1%
	1V2R	74.4	71.0	39.7%
	1V3R	261.0	204.0	16.3%
	1V4R	3.6	7.9	231.7%
	1V5R	43.5	35.5	14.6%
2V	2V5R	3.2	13.8	513.9%
6V	6V1R	18.9	18.5	61.7%
7V	7V	/	38.9	/
	7V1R	69.2	10.8	-78.3%
	7V1R1L	17.8	24.3	101.0%
	7V3R1L	3.0	36.7	4755.1%
	7V5R1L	9.0	18.5	173.4%

Source: ResearchInChina

In April 2024, PhiGent Robotics released an upgraded version of PhiGo, an intelligent driving solution, at the Beijing International Automotive Exhibition. Using 7VnR, the standard version of PhiGo Pro requires 30-80TOPS computing power (compared to 32-100TOPS for the previous generation), and the cost is reduced to lower than RMB4,000.

7VnR Solution of PhiGent Robotics

Extremely cost-effective

PhiGo Pro Highway NOA + HPA (7VnR)


Highways + urban areas
Highways + urban expressways
Expandable urban scenarios of HPA

General obstacle recognition
BEV + Occupancy
@ Transformer

Extremely cost-effective
Fisheye sensor reuse
Cost: RMB4,000

All-in-one functionality
Intelligent chassis and other functional expansions

Intelligent fuel and electricity
Based on passive cooling hardware platform
Both oil and electricity



*Actual configuration can be customized according to customer needs


S e n s o r configuration

- Binocular version: 1x 8MP 120° binocular stereo camera
- Monocular version: 2x 8MP 120°&30° monocular front view camera
- 4x 2/3MP 195° fisheye surround view camera (reused for parking)
- 1x 2MP 60° rear view camera
- 1x radar (optional corner radar)

Recommended computing power 30-80 TOPS

Recommended computing solution Horizon Robotics Journey 6

Map specifications SD maps and above, mapping by memory



400,000 sets designated by China's top OEMs for their benchmarking models

Source: PhiGent Robotics

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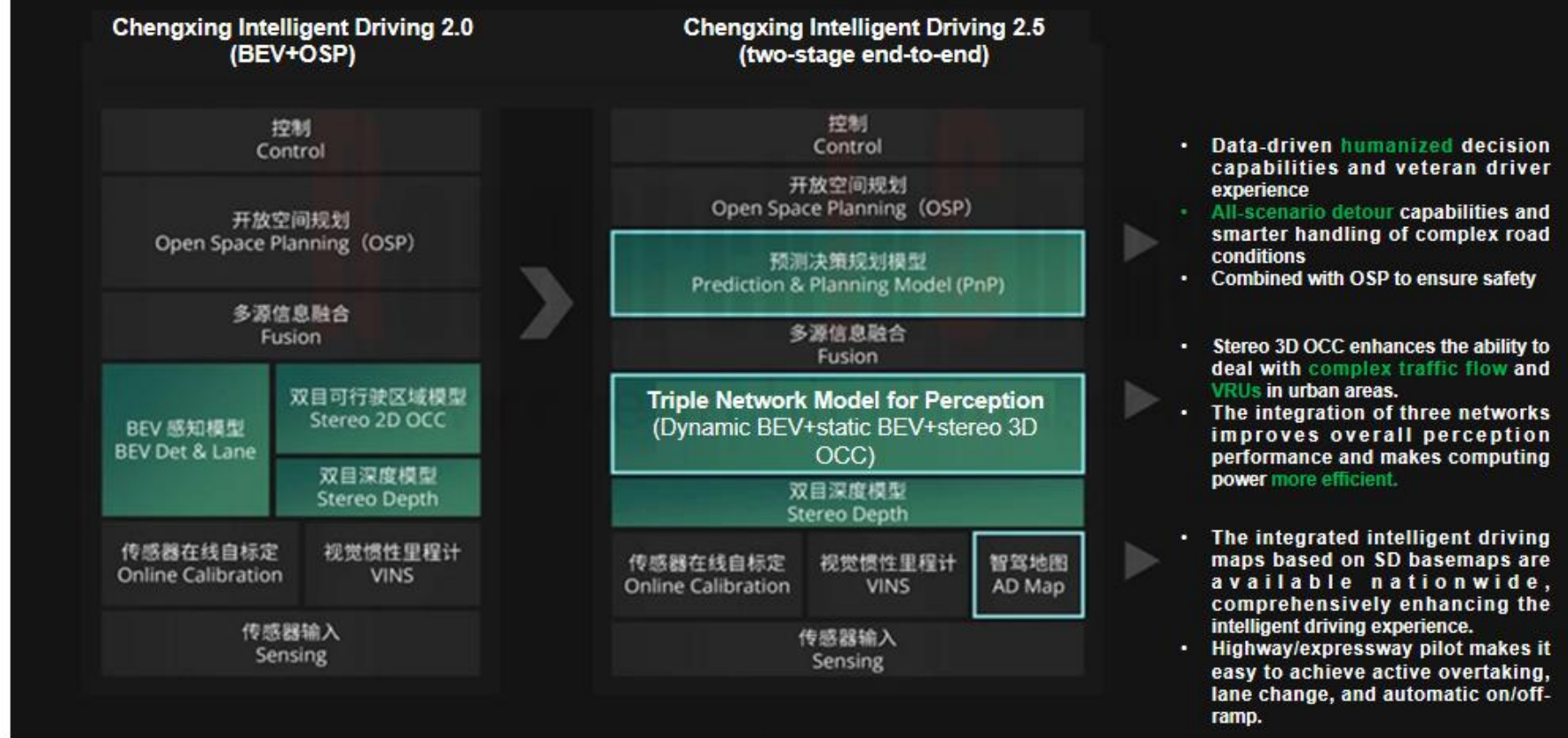
In September 2024, Zhuoyu introduced Chengxing Intelligent Driving 2.5, an upgraded version of the intelligent driving software of the Chengxing Platform. Compared with Chengxing Intelligent Driving 2.0, the 2.5 version enables mass production of the industry's first two-stage end-to-end technology for medium-compute platforms and improves intelligent driving experiences in multiple scenarios.

Chengxing Intelligent Driving 2.5 VS Chengxing Intelligent Driving 2.0

Major upgrades of the "two-stage end-to-end" architecture

Legend Data-driven

Equipped with Chengxing Intelligent Driving 2.5
Rewrite the core intelligent driving modules such as perception, prediction, decision and planning



Source: Zhuoyu

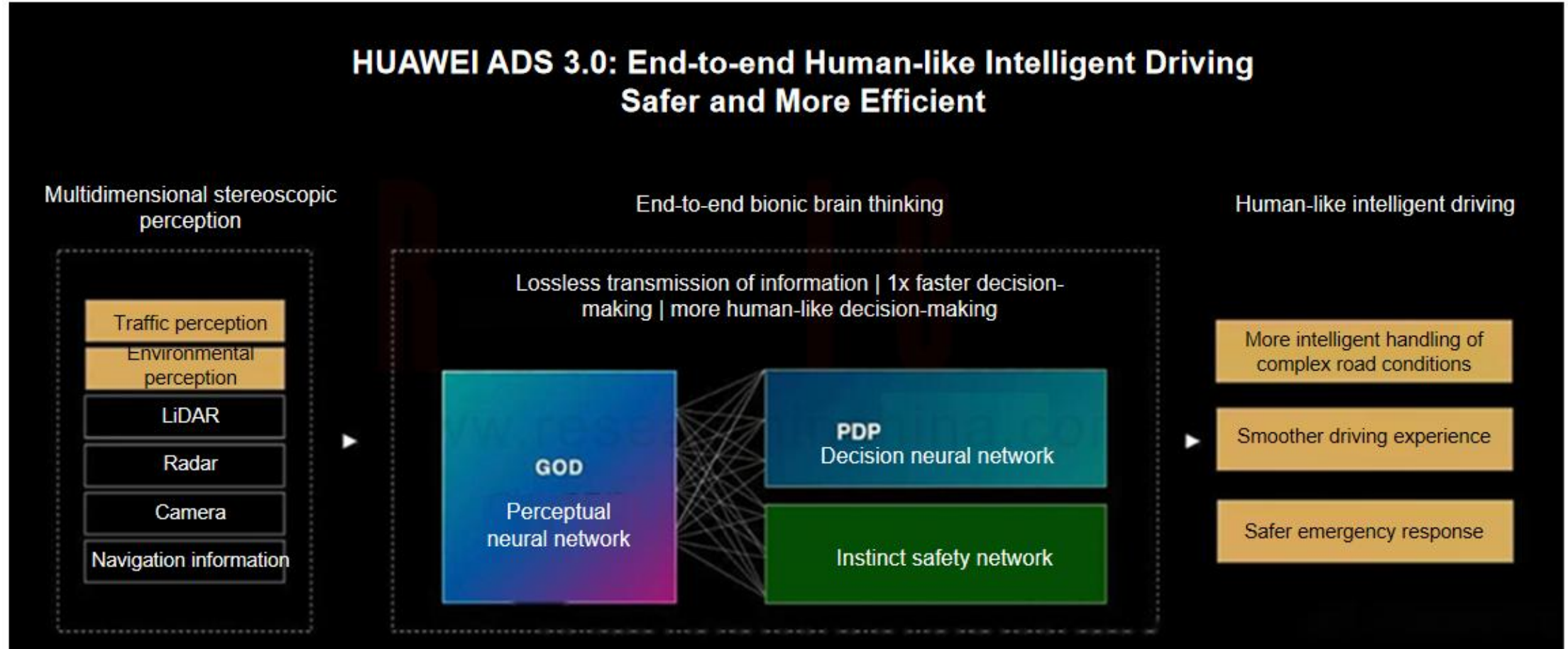
The two-stage end-to-end technology of Chengxing Intelligent Driving 2.5 is based on 7V+32TOPS hardware configuration

The two-stage end-to-end technology of Chengxing Intelligent Driving 2.5 is based on 7V+32TOPS hardware configuration. It applies the perception three-network integration model and the prediction-decision-planning integration model, improving the ability to bypass obstacles/VRUs in urban areas, turn left and right at intersections and cope with complex scenarios. In addition, Chengxing Intelligent Driving 2.5 also introduces the "AD Map" as a "special sensor", and the capability of updating a single vehicle's multi-route memory, and further improves the intelligent driving experience in highway pilot and urban memory pilot.

It is known that the basic version of Zhuoyu's Chengxing Platform uses 7V+32TOPS (chip from Texas Instruments) to enable highway NOA and urban memory pilot. The hardware of this solution costs only RMB5,000. It has been mass-produced for models such as Baojun Yunduo, Chery iCar03 and Yep Plus.

In addition to Zhuoyu, Huawei also unveiled a vision-only intelligent driving solution applying end-to-end technology, based on ADS 3.0.

Huawei ADS 3.0



Source: Huawei

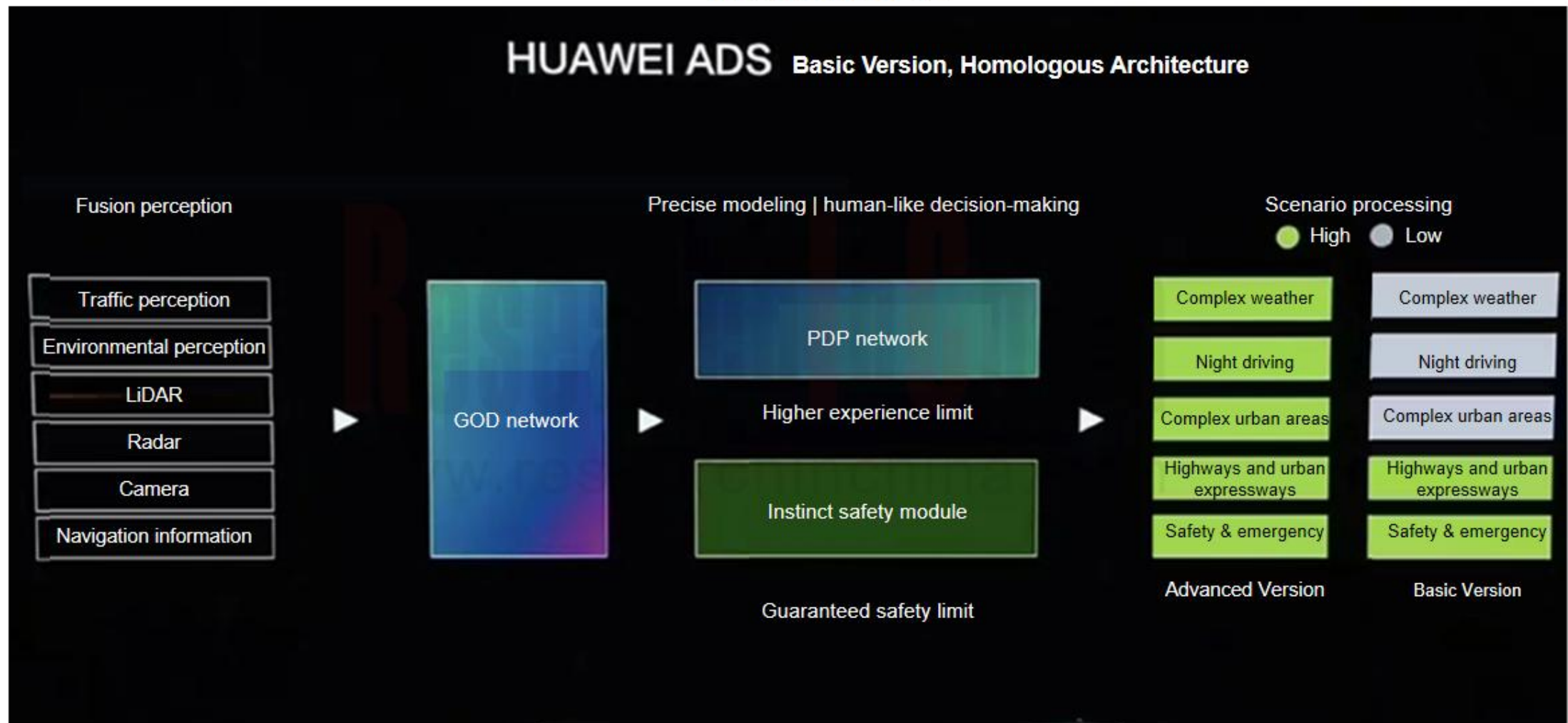
ADS SE, Huawei's vision-only solution, is installed on models like Deepal L07 (MSRP: RMB151,900-173,900), and Deepal S07 (MSRP: RMB149,900-207,900). ADS SE has lower cost than ADS 3.0, and it spreads to models priced below RMB200,000.

In addition to local manufacturers, overseas manufacturers have also joined the melee in the high-level intelligent driving market, and have launched vision-only solutions to dabble in vehicles priced below RMB200,000.

In October 2024, Continental Xinzhiijia (a joint venture between Continental and Horizon Robotics) announced the vision solution "Astra" for the Chinese market. This solution uses the 11V1R solution (compared to the mass-produced mid-level intelligent driving solutions on market, it adds side-view cameras). Based on the Horizon J6 E computing platform (80 TOPS), it can enable L2+ and driving-parking integration in all scenarios, and support lightweight urban NOA (mainly including intersections with traffic lights, left and right turns, etc.), highway NOA, HPA and APA.

Continental Xinzhiijia's L2+ solution is oriented to the mid-end market of high-level intelligent driving. With the cost of about RMB6,000, it targets models priced at RMB100,000-200,000.

Huawei ADS SE



Source: Huawei

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