



Driven by User-value, Promoting High-level  
Smart Driving to a New-era with Software  
and Hardware Technologies

LV Peng,

Vice President of Horizon Robotics



**BOSCH** Continental



STELLANTIS

**TOYOTA** VOLKSWAGEN GROUP

# China Automotive Industry At Tipping Point

Electrification is first-half, intelligentization is second-half: Urban NoA will be the key for future winner

## The first half, EVs, a foregone conclusion

### 2024 Penetration rate for NEV<sup>1</sup>

~50%

The penetration rate of new energy vehicles in China has exceeded 50% for **four consecutive months**

### 2024 Market share for Chinese brands

65.1%

In 2024, Chinese brands dominate the wholesale sales of passenger vehicles

**Note:**  
1. New energy vehicles include BEV, PHEV, and REEV.

## The second half, AVs are the right time

"Electrification" is now standard



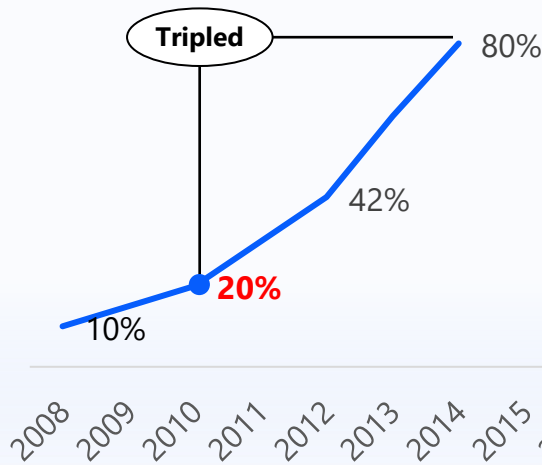
The "intelligentization" tipping point has arrived



The "mass adoption" race has begun

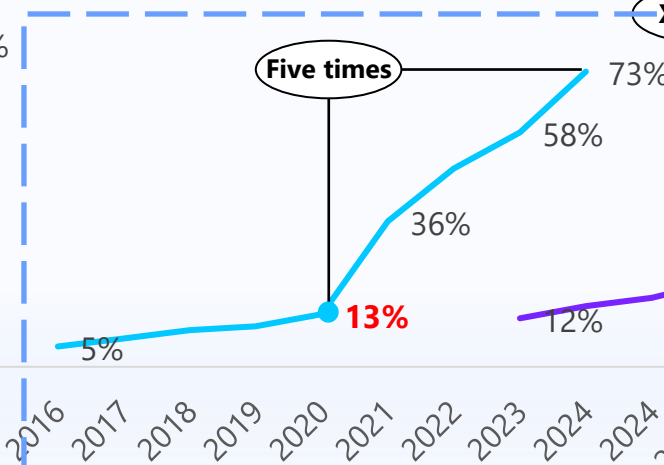
### [Smartphone]

Increasing **3 times** within 4 years, after reaching tipping point 20% penetration



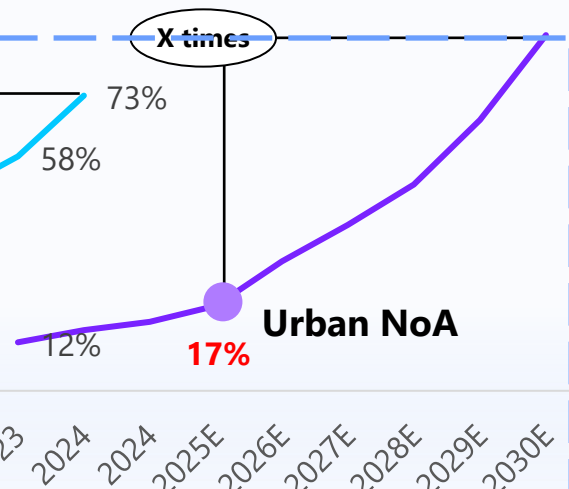
### [EV]

Increasing **4.62 times** within 4 years, after reaching tipping point 13% penetration



### [Urban NoA]

Take rate will reach 17% by this year, tipping point is coming



Source: CPCA, expert interviews, government statistics, filings of listed companies, news disclosures and Zhuoshi Consulting

# Democratization of Intelligent Driving: BYD Strategy

In the era of fuel vehicles:  
Powertrain configurations shaped consumer perception: No turbo = poor performance.



In 2021, turbocharged engines dominated China's fuel vehicle market with  
**~75%**

In the intelligent vehicle era,  
Driver-assistance features now define intelligence:  
**No advanced intelligent driving = Not smart.**

Intelligent Driving  
Comprehensive  
Standardization

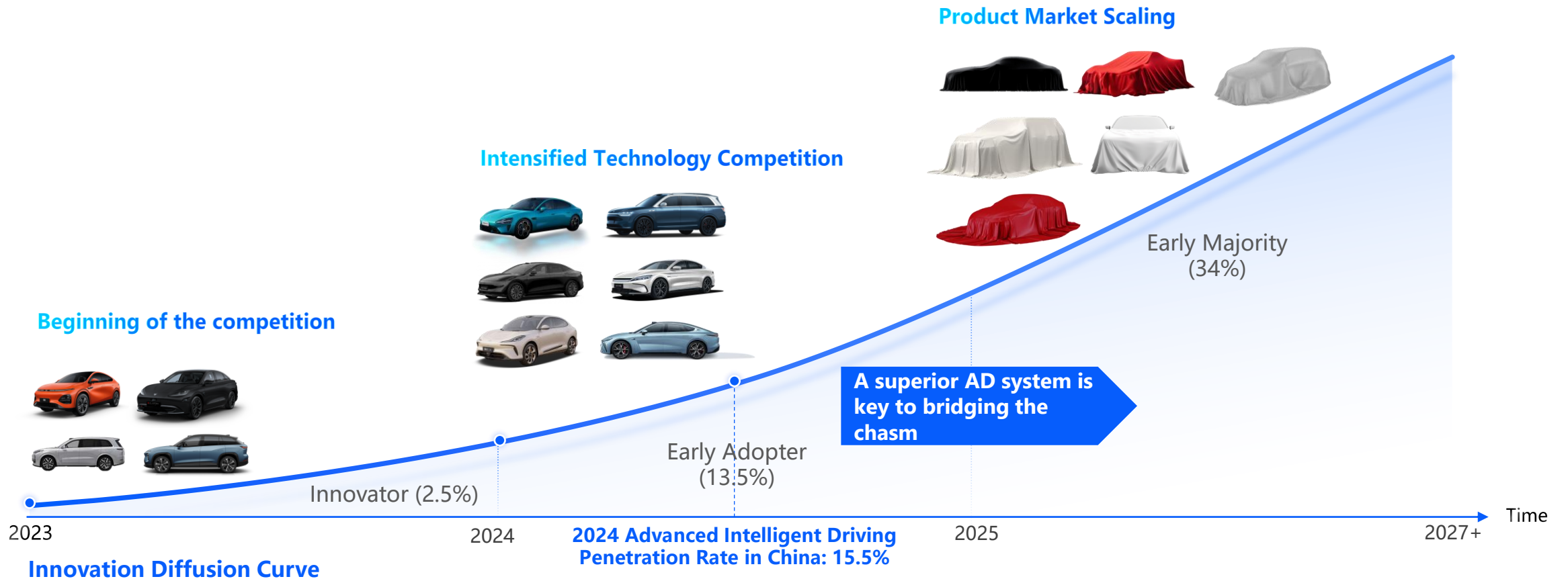
天神之眼

Redefining users' Tech Beliefs Anew,

Shaping an intelligentization brand with a vision true



# 2025 Will Mark the Decisive Moment for Advanced AD



# Horizon Outperforms Advanced AD System in the 'Triathlon'

Achieving High Performance and Reliability in Technology, Engineering, and Product Design



## Industry Leading Technology

Redefining industry tech prowess and depth,  
Exposing strengths and weaknesses with precision.

## Rigorous Engineering

Blending advanced technology with  
mass production expertise is crucial for  
transforming technology into products.

## Human-Oriented Product Design

Focusing on user value and market demands,  
Advancing technology for the benefit of  
humanity

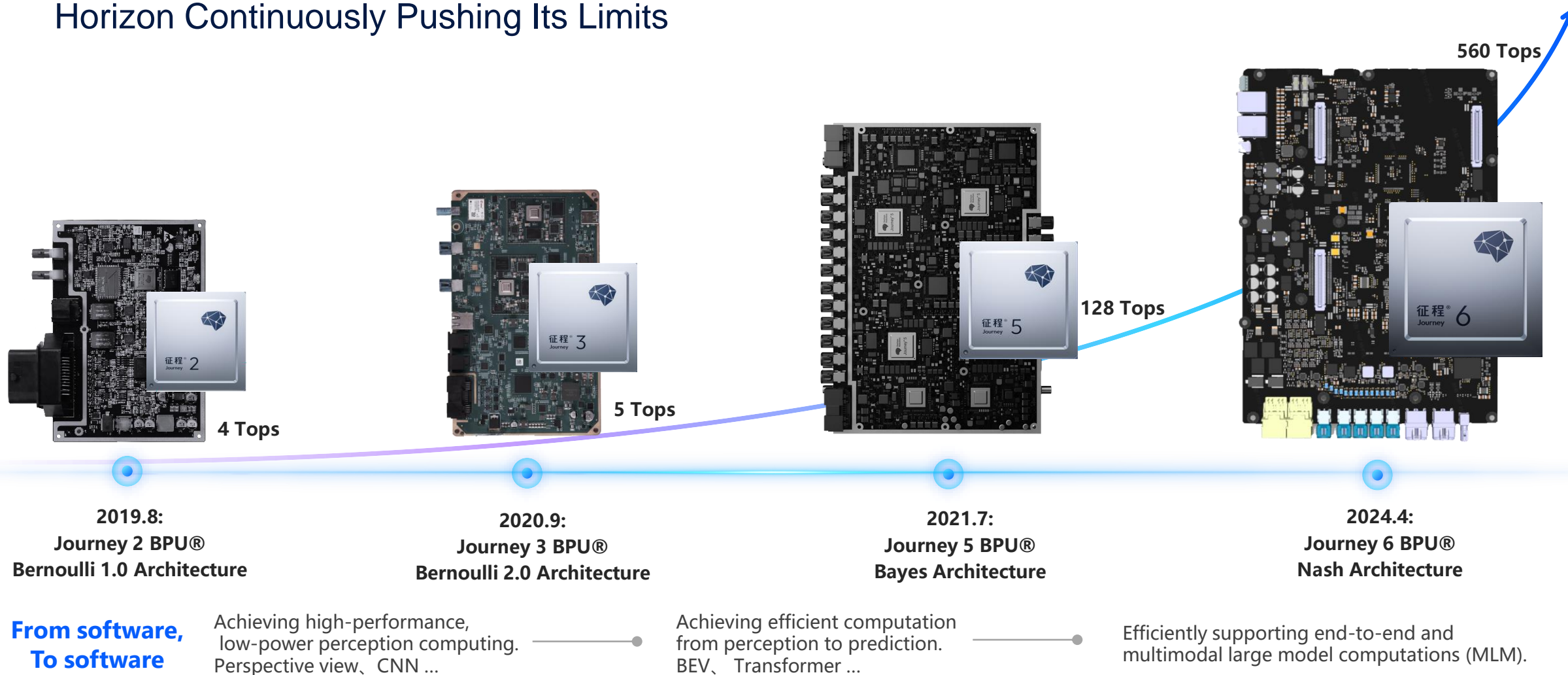


# Industry Leading Technology



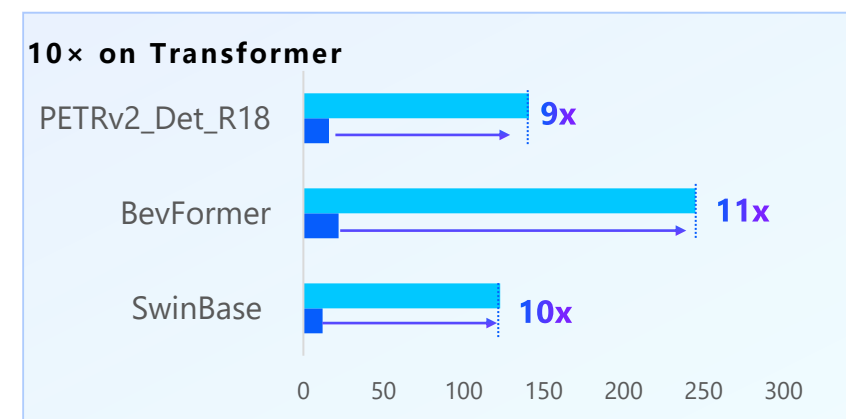
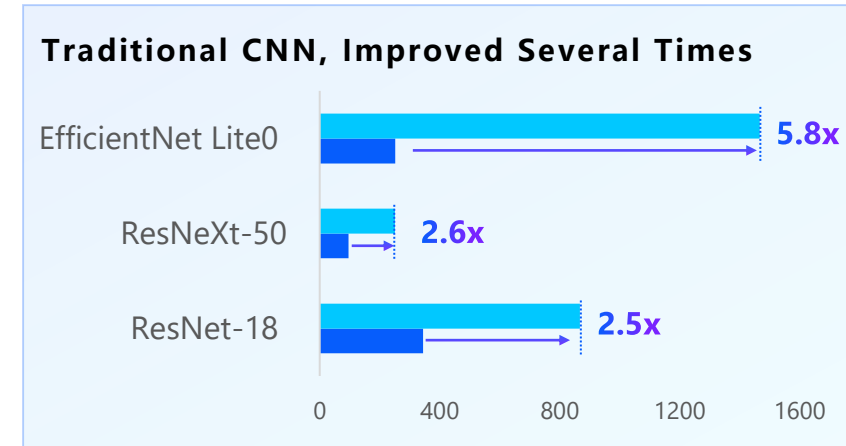
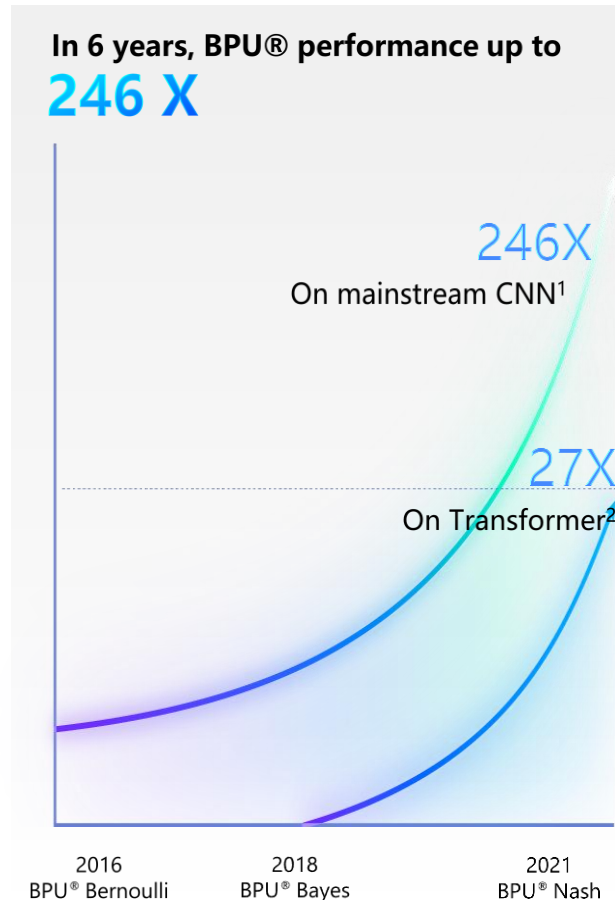
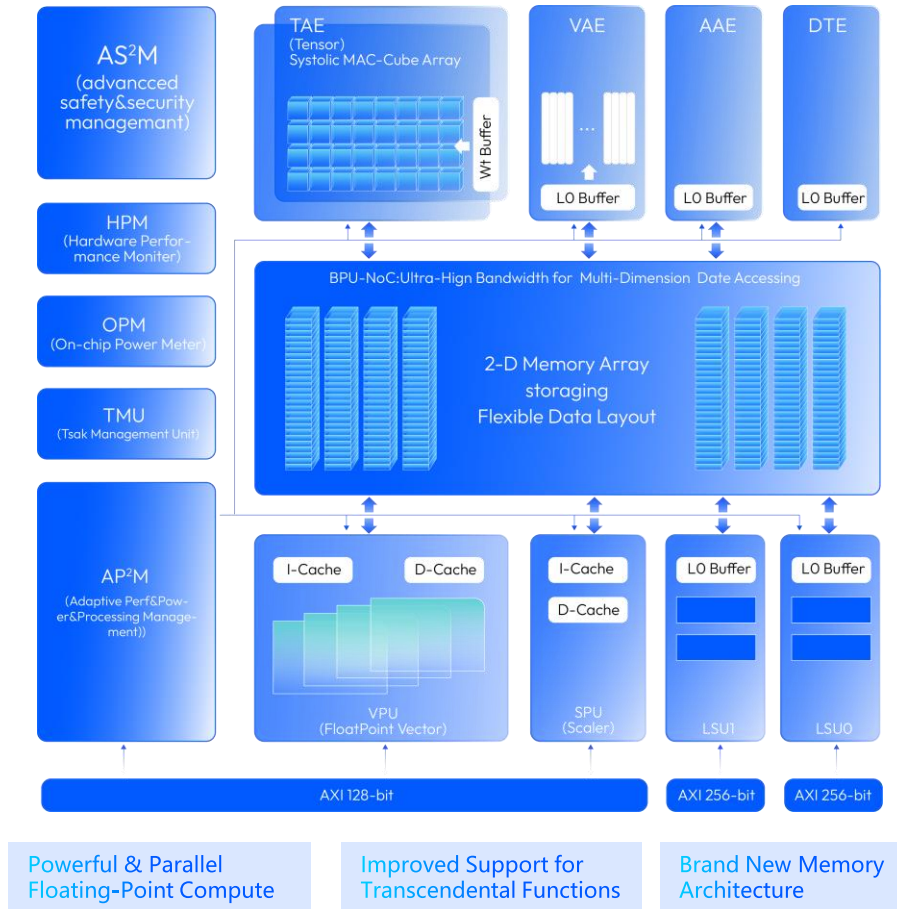
# System Performance Across Eras: Defined by the Main Chip

Horizon Continuously Pushing Its Limits



# Horizon BPU Demonstrates Fastest Performance Growth in Industry

## BPU® Nash - Tailored for Large Transformer Models



■ Journey 6P ■ Mainstream Competitors

# World-class Algorithms Optimized for Complex Driving Scenarios

**2020** Won 4 World Championships out of 5 in the 1<sup>st</sup> Waymo algorithm competition



“ One of the **largest, richest** and **most diverse** self-driving data sets ever released ”  
 — **Drago Anguelov**  
 Waymo's Chief Scientist & Head of R&D

Out of over 120 Research Teams:



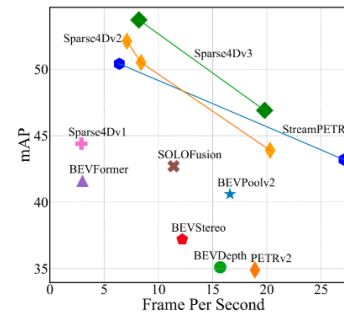
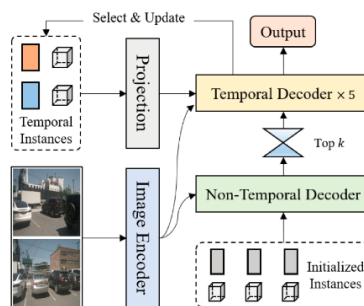
**2022** Sparse4D Ranked 1<sup>st</sup> on nuScenes Open Dataset

Pure Sparse Long Time Series Efficient End to End

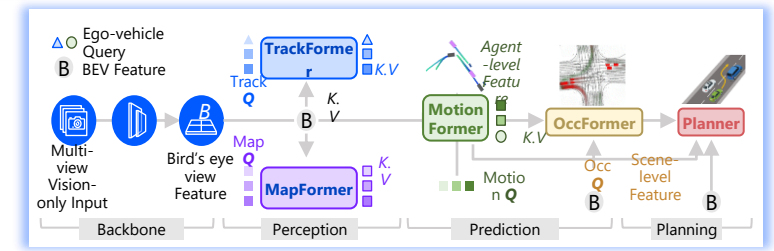
NUSCENES by Motional

Tracking Leaderboard

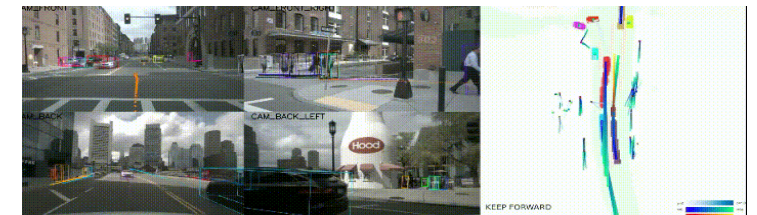
- No explicit view transform
- Computation & bandwidth efficient
- More stable detection
- Independent of distance and resolution



**2023** UniAD Won CVPR 2023 Best Paper Award



Incorporate full-stack driving tasks in one **end-to-end transformer-based framework**



# 2024: Continuous Algorithmic Innovation and Exploration

## Vision Mamba

[ICML 2024]

The Biggest Challenger to Transformer;  
FIRST linearly-complex, globally-context visual foundation model; Superior Performance:  
Outperforms existing top models like DeiT/Vim in multiple standard vision tasks, with faster speed.  
(Compute Speed Improved 2.8x), (GPU Memory Saved 87%)

全球AI论文引用TOP 3

- 1 The Llama 3 Herd of Models
- 2 Mixtral of Experts
- 3 Vision Mamba: Efficient Visual Representation Learning...
- 4 Gemma: Open Models Based on Gemini Research...
- 5 Gemini 1.5: Unlocking multimodal understanding...
- 6 Phi-3 Technical Report: A Highly Capa...
- 7 KAN: Kolmogorov-Arnold Networks
- 8 Large Language Models: A Survey
- 9 QWEN2 Technical Report
- 10 DeepSeek-Coder: When the Large Language Model...

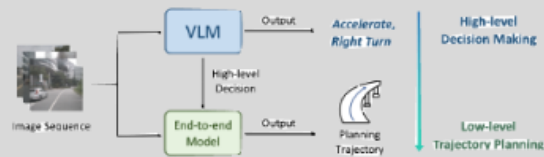
Lianghui Zhu, Bencheng Liao, Qian Zhang, Xinlong Wang, Wenyu Liu, Xinggang Wang; Vision Mamba: Efficient Visual Representation Learning with Bidirectional State Space Model (ICML 2024)  
<https://arxiv.org/abs/2401.09417>



Innovative Foundation Vision Network

## SENNA

Industry first-invented [ Large Model High-Dimensional Decision Making ] + [ End-to-End Precise Trajectory Planning ] new driving paradigm, reducing planning errors by 27.12% and collision rates by 33.33%. Demonstrating powerful cross-scenario generalization and transferability.



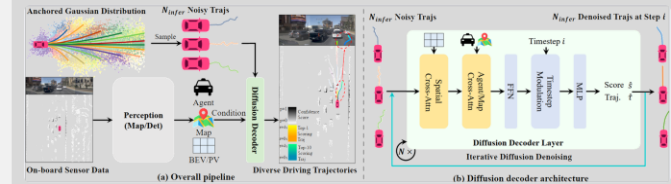
Bo Jiang, Shaoyu Chen, Bencheng Liao, Xingyu Zhang, Wei Yin, Qian Zhang, Chang Huang, Wenyu Liu, Xinggang Wang; Senna: Bridging Large Vision-Language Models and End-to-End Autonomous Driving  
<https://arxiv.org/abs/2410.22313>

Innovative Model Architecture Design

## Diffusion Drive

[CVPR 2025]

Pioneered the truncated diffusion strategy, introducing multi-modal priors into generative diffusion models to enhance diversity and real-time performance. Significantly reduced denoising steps, boosting efficiency by 10X and setting a new closed-loop evaluation record of 88.1 PDMS.



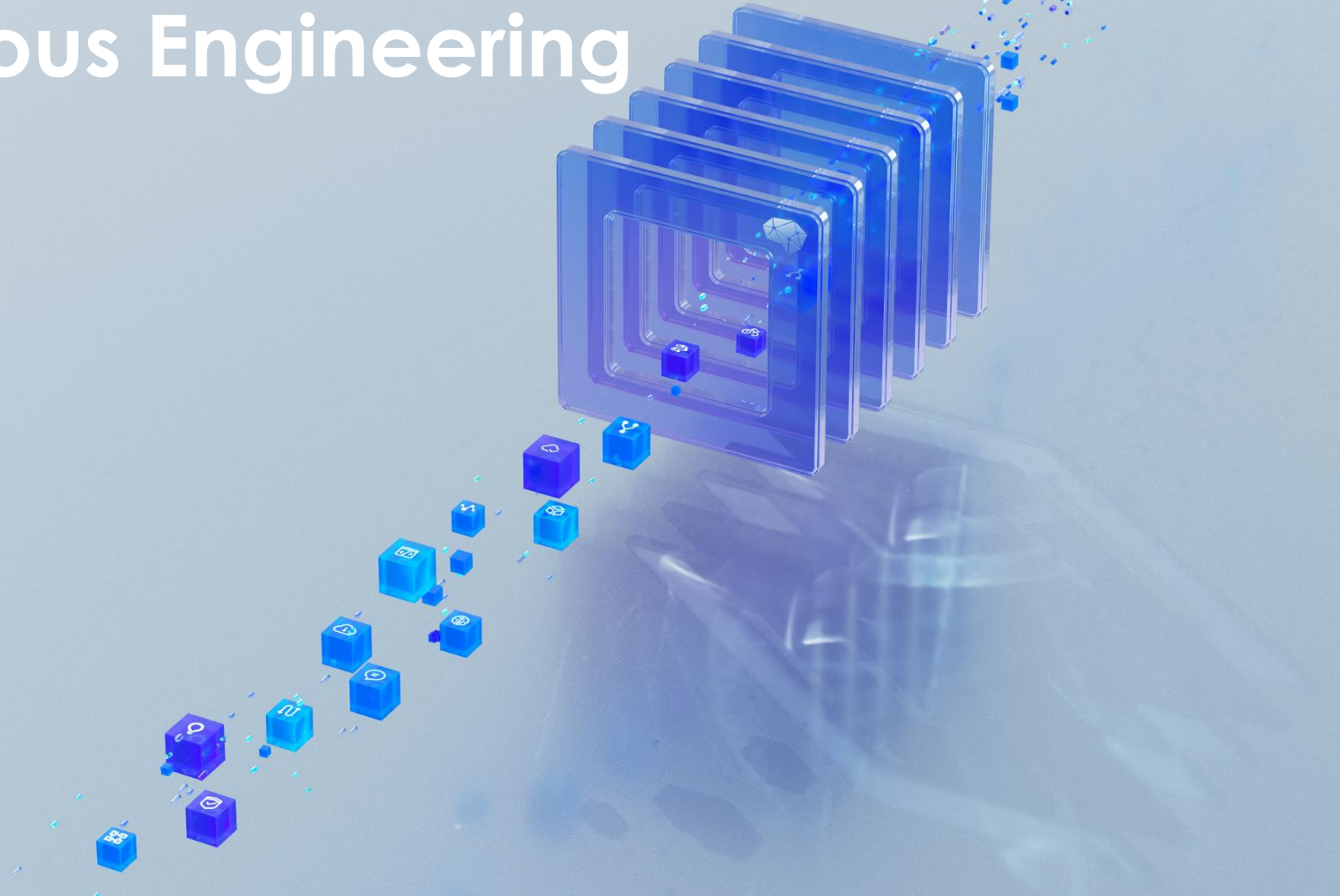
Bencheng Liao, Shaoyu Chen, Haoran Yin, Bo Jiang, Cheng Wang, Sixu Yan, Xinbang Zhang, Xiangyu Li, Ying Zhang, Qian Zhang, Xinggang Wang; DiffusionDrive: Truncated Diffusion Model for End-to-End Autonomous Driving  
<https://arxiv.org/abs/2411.15139>



Innovative End-to-End Generative Solution

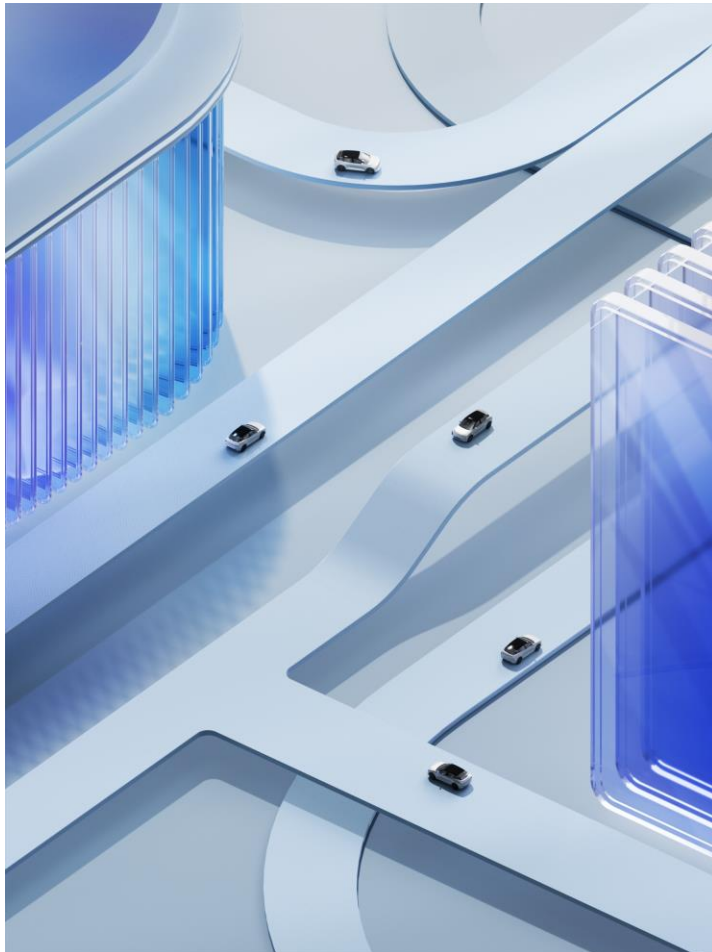


# Rigorous Engineering



# Engineering Capabilities For Development And Implementation Of ADAS/AD System

Crafted By Millions Of Mass Production Experience



**AUTOSAR**



## Advanced Forward Development Concept

- Accelerating Overall Development Pace by 12-18 months with SoC, HW and SW Parallel Design
- Using matured solution and maximizing previous know-how
- Dev infra accelerates SW Iteration by 100X



## Large-scale Automated Test System

- Complete test system for HW, SW and algorithms
- CI/CD based automated testing with verification time reduced to days
- Various test laboratories set up for Production Support
- Efficient infrastructure reduces verification time by more than 95%



## Agile Development With Efficient Iteration

- Speed up version iteration to a monthly basis
- achieve bi-directional synchronization with customers to facilitate rapid iteration achieving time reduction by 50%
- Comply with process standards to ensure high-quality SW release

AIDI

TogetherROS

OpenExplore

# Horizon Has Most Complete Domestic Safety Management And Certification System

First in Compliance with  
ISO26262 ASIL-D  
Development Process

First in Compliance with  
ISO/SAE 21434

First in Compliance with  
Functional Safety Standard  
Process Certification

First in Compliance with  
ISO 26262 ASIL B of  
Active Safety Function

## Automotive Functional Safety Management and Product Certification



Journey® 5, Journey® 6 obtained ISO 26262 ASIL-B (D) certification

Active safety function obtained ISO 26262 ASIL-B certification AEC-Q100 Grade 2

## Cybersecurity and Information Security



ISO/SAE 21434 ML3

CCRC EAL3+

CATARC Automotive  
SoC Chip Certification

ISO27001

TISAX AL3

## Development Process and Quality Management System



ASPICE CL2

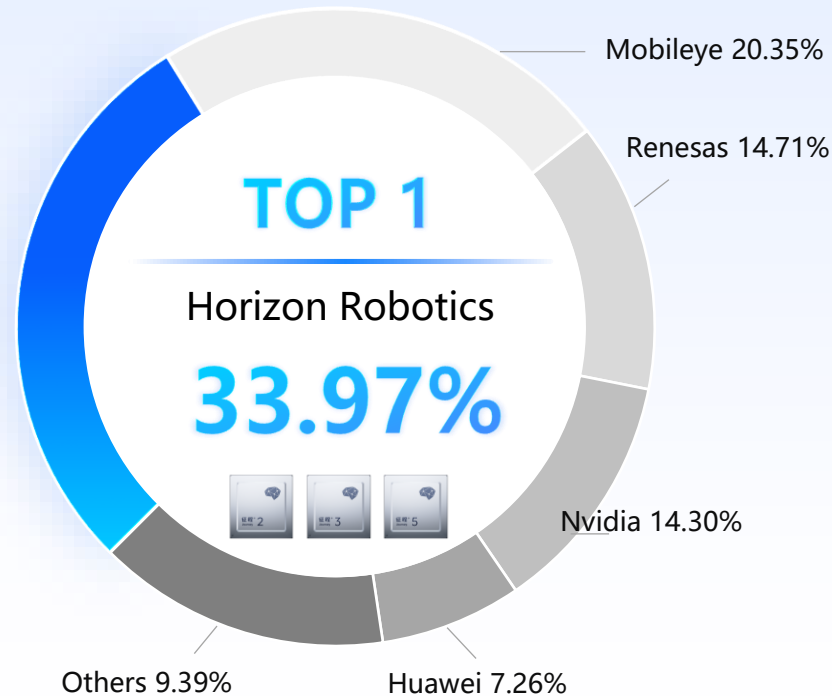
ISO21448

## Customer Audits Passed



# We are now No.1 for automotive computing solutions in China

C-OEM passenger vehicle ADAS/AD market:  
Horizon Robotics Leads in TOP 1



Journey® : The leading solution in all market segments

Source: Gaogong AI



# Human-Oriented Product Design

# A Great AD System Born of In-depth Insights of The Users

AD System 1.0

**Safe to use**

Offers "physical safety"

AD System 2.0

**Easy to Use**

Human-like, provides  
"psychological safety"

AD System 3.0

**Love to use**

Anytime, Anywhere, Anyone

# HSD: Best Practice Of Combining HW & SW, A New Benchmark For Advanced AD System

Elegant | Assertive

Intelligent Driver Always ON

Intelligent driver under  
user supervise



Full scenarios AD

**Elegant** Smooth Driving Capabilities

Obstacle avoidance  
ability

Gentle & humanlike  
braking

Smooth turning  
capability

Elegant yielding  
capability

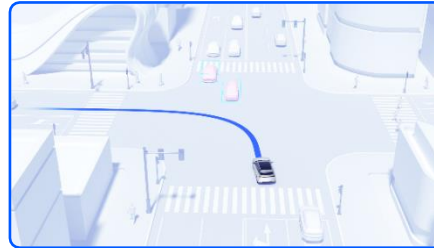
**Assertive** Proactive and Confident Driving Style

Lane-changing  
gap-finding ability

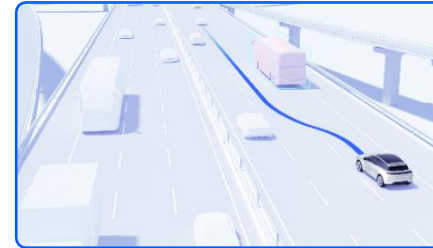
Active merging in  
congestion

Low speed gaming  
ability

Narrow path gaming



Urban



Highway



Parking

Proactive Safety Always ON

Drive with intelligent  
assistance



Full Scenarios Safety Coverage

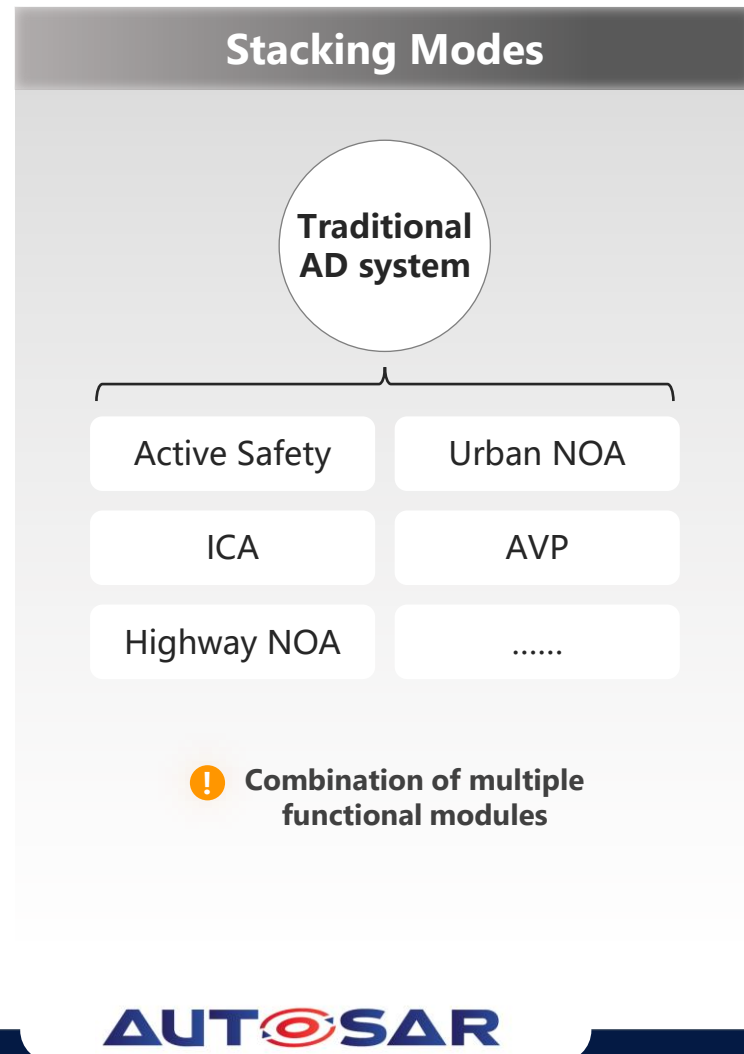
Collision Avoidance at Low Speeds

Enhance-AEB with Greater Speed Range & More Obstacles

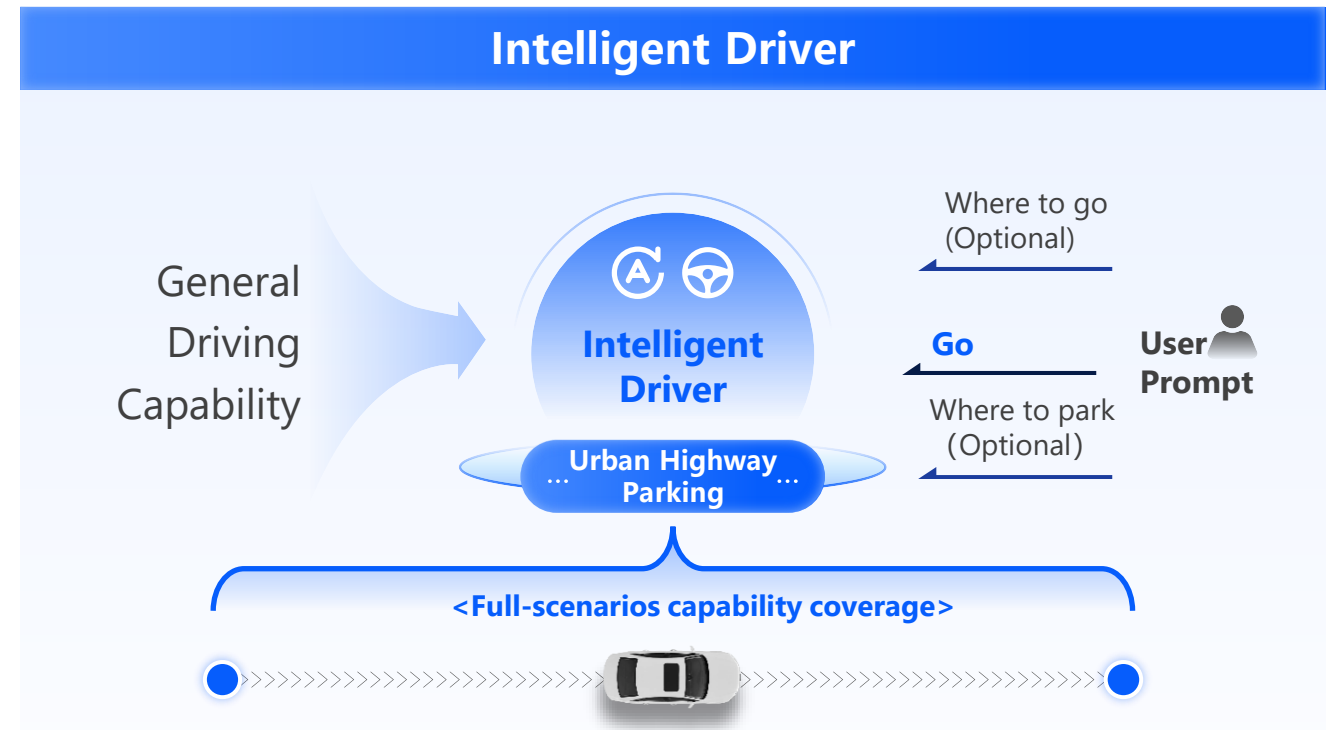
More Accurate Collision Alerts

# HSD: Seamless Advanced AD Across All Scenarios

Uniform coverage | Consistent mode | Seamless experience



VS



**One-click Start**

No Activation Limitations  
Across All Scenarios

**One-model Fits All**

Seamless Mode-free Operation  
Across All Scenarios

**Enjoy Every Journey**

Seamless Experience  
Across All Scenarios

# HSD: Continuously enhance product value



AUTOSAR

[China's first]

**urban NOA with reversing driving capability**



[China's first]

**roaming mode**



[Industry's fastest]

**Response to Traffic Light**



# HSD HMI: Creating the TOP AD Interface, Winner of the 2025 iF Design Award



## [2025 iF Design Award]

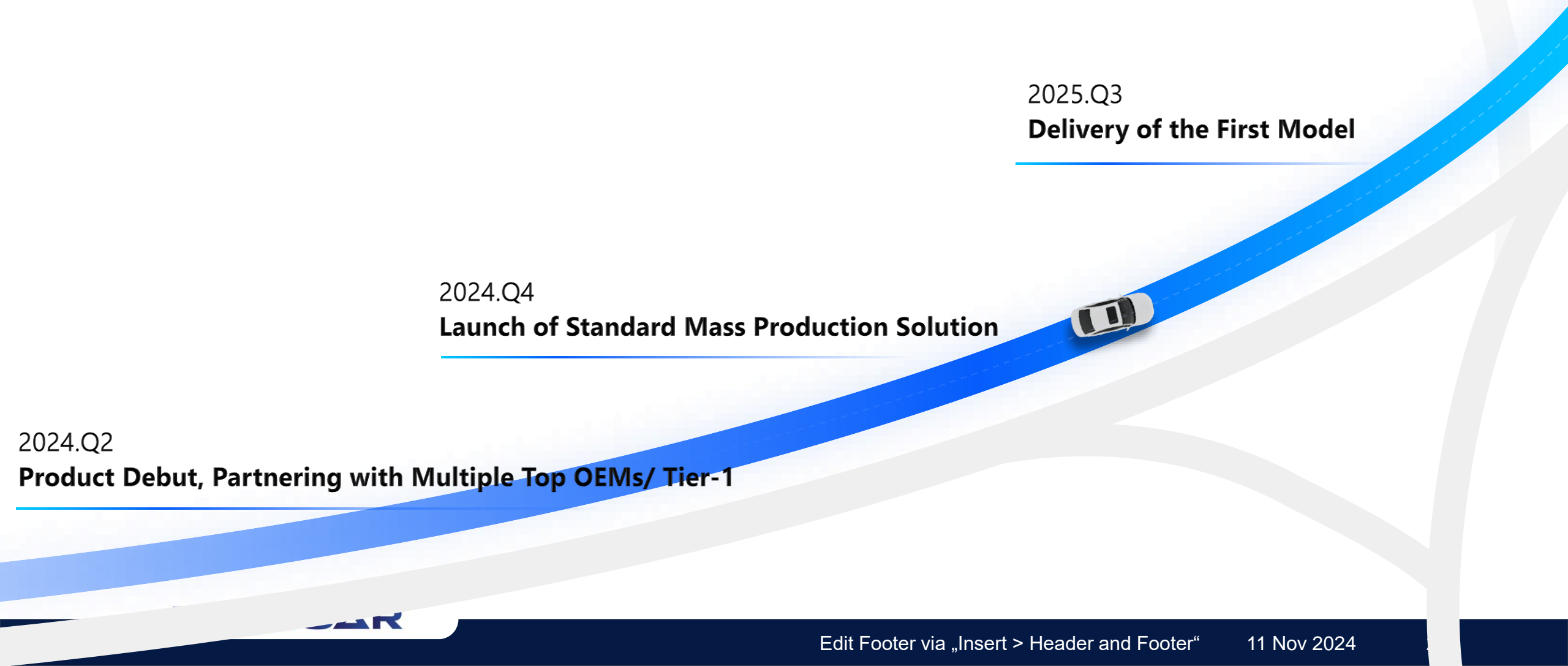


The German iF Design Award, established in 1953, is the 'Oscar' of the global design community and one of the top three most prestigious in industrial design worldwide

HSD HMI leverages **real-time multi-sensor fusion and 3A-level game rendering to build trust** by clearly conveying vehicle behavior. It revolutionizes intelligent driving by integrating game-level graphics into interaction systems. This innovation **reduces perception costs while delivering a safer and more transparent human-machine experience**, setting a benchmark for intelligent mobility solutions.



# To Create a High-Performance Full ODD AD System Affordable to All



# Horizon's Journey® 6 series has achieved design-in car models with

# 20 brands

*Incl. TOP BEV C-OEM, TOP Premium C-OEM, TOP ICE C-OEM and TOP G-OEM in China...*

Starting from 2025,

Journey 6 series will empower the launch of over **100** car models with L2+ intelligent driving solutions.





Thanks



**BOSCH** Continental



STELLANTIS

**TOYOTA** VOLKSWAGEN GROUP