

CASIC PERSPECTIVES

Initiative on Standardization Development for AI Technologies in the Automotive Industry (2025)

July 2025

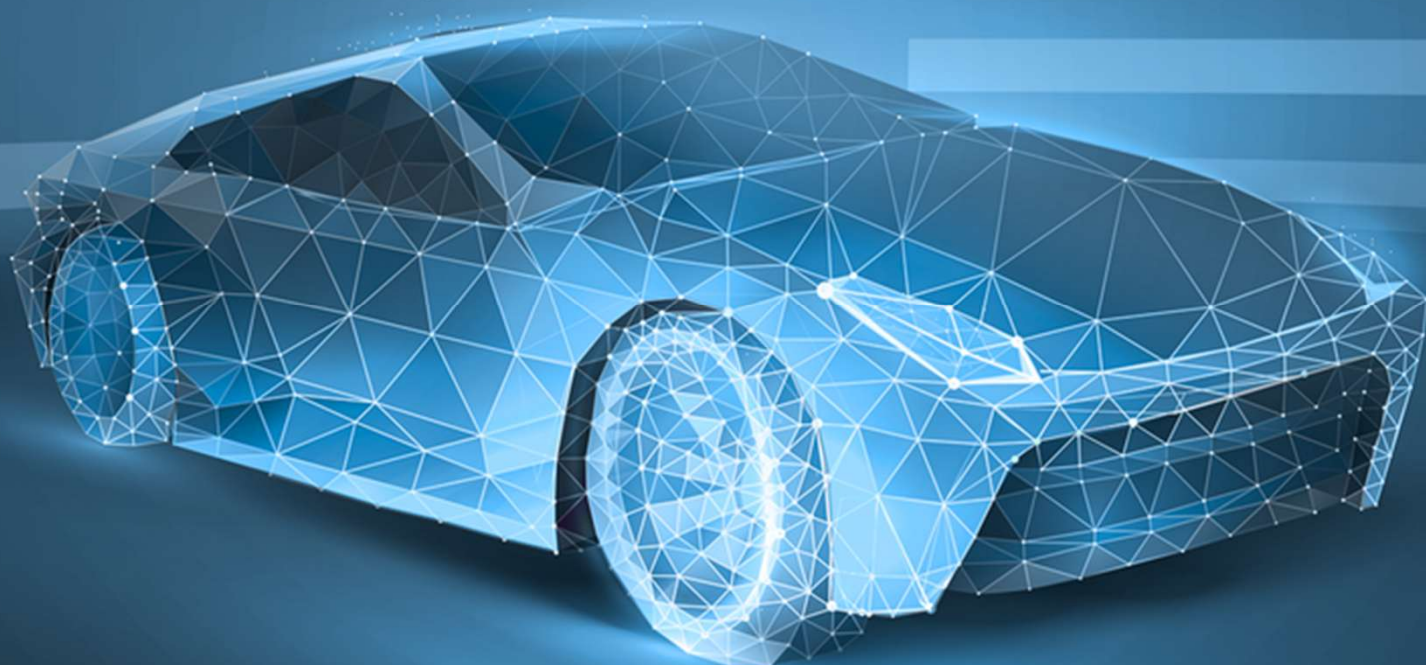


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Preface



Artificial Intelligence (AI) is profoundly reshaping the global automotive industry, driving innovation in intelligent vehicles and redefining future mobility. As the convergence of "AI + Automotive" accelerates, it presents unprecedented opportunities alongside critical challenges—including imperfect ethical norms and governance mechanisms, insufficient safety and reliability, and low explainability. Addressing these challenges demands robust, harmonized international standards to foster trust, ensure safety, and enable responsible innovation worldwide.

As an organization dedicated to **advancing the internationalization of Chinese automotive standards and facilitating dialogue among global stakeholders, the China Automobile Standards Internationalization Center (Geneva) — CASIC** recognizes the urgent need for collaborative frameworks in AI standardization. Building upon the foundational consensus of the 2024 "Initiative on Standardization Development for AI Technologies in the Automotive Industry" (jointly drafted by leading Chinese industry bodies) and informed by ongoing engagement with international regulators and standards organizations (e.g., ISO, IEC, ITU, UNECE), and industry partners, CASIC now releases this **CASIC Perspective** document.

This initiative serves two core objectives:

1 Articulate a Global Vision

We intergrade critical insights from China's industry practice and global discourse into a unified framework for automotive AI standardization:

"5 Focus Areas (Ethical Norms; Risk Prevention; Public Trust; Oversight & Competition)"

+ 1 Standardization Development Roadmap"

This framework provides clarity for international collaboration:

- 1 Ethical Norms**—Establishing globally accepted principles for responsible AI.
- 2 Risk Prevention**—Ensuring system safety and human security.
- 3 Public Trust**—Enhancing transparency and protecting user rights.
- 4 Oversight & Governance**—Defining accountability and governance pathways.
- 5 Collaborative Competition**—Balancing open innovation with market fairness.

Standardization Roadmap—Charting a path toward interoperable global standards.

Preface



2 Catalyze International Cooperation

As a neutral platform based in **Geneva — the hub of global technical diplomacy —** CASIC issues this Perspective to:

Bridge Regulatory Divides

Foster mutual understanding among key regions (e.g., EU, U.S., China).

Facilitate Standards Convergence

Align regional/national standardization with international benchmarks.

Amplify China's Contribution

Share China's experience in implementing the "5+1" framework.

Empower Industry Action

Provide a consensus-based reference for global automakers, suppliers, and policymakers.

Why CASIC Issues This Perspective:

Our Mandate

To advance Chinese automotive standards globally and promote technical cooperation.

Our Position

Strategically located in Geneva, we interface with ISO, IEC, ITU, and UNECE WP.29, enabling us to convene diverse stakeholders.

Our Commitment

Inclusive, harmonized standards are foundational to a safe, innovative, and integrated global automotive ecosystem.

We call upon global industry players, Standards Development Organizations (SDOs), regulators, and academia to:

Engage in Dialogue

Utilize the "5+1" framework as a basis for multilateral discussion.

Collaborate on Solutions

Work through CASIC and international platforms to develop actionable standards.

Embrace Harmonization

Prioritize interoperability to accelerate safe global deployment of automotive AI.

This **CASIC Perspective** underscores our conviction that **international collaboration is essential to navigate the complexities of AI in the automotive sector**. We stand ready to serve as a bridge for this critical mission.

Geneva, July 2025

China Automobile Standards
Internationalization Center(Geneva)

A hand is shown holding a glowing, interconnected network of nodes and lines, resembling a digital or neural network. The background is a deep blue with a subtle pattern of light blue dots and lines, suggesting a digital or technological theme. The hand is positioned in the lower right, with the fingers wrapped around the glowing structure. The overall image has a futuristic and high-tech feel.

1

Standardize Ethical Conduct and Practice Fundamental Principles

Standardize Ethical Conduct and Practice Fundamental Principles

Adhere to a People-Oriented Approach

We advocate that AI technology in the automotive industry should aim to better serve people. Throughout the entire process of development and application, the principle of being people-oriented should be upheld. AI should not be used for activities that endanger humans, society, or public safety. During interactions with drivers and passengers, their dignity must not be compromised, nor their rights violated or trampled upon.

Pursue Fairness and Justice

We advocate that AI technology in the automotive industry should treat all members of society fairly, justly, and equally. Full respect should be given to differences in religious beliefs, specific identities, and cultural traditions, while fully considering the specific needs of different groups. Efforts should be made to eliminate entrenched discrimination and prejudice, ensuring that AI technology in the automotive industry is inclusive and beneficial to all.

Comply with Laws and Regulations

We advocate that the development and application of AI technology in the automotive industry must comply with laws and regulations. All entities involved in the development and application of AI systems in the automotive industry must adhere to the relevant national laws, regulations, standards, and industry practices.

Establish Clear Traceability Mechanisms

We advocate ensuring traceability in the operation of AI technology in the automotive industry. Clear traceability supports clarifying the responsibilities of relevant parties and the rights and obligations of all stakeholders.

Enhance Transparency and Explainability

We advocate enhancing the transparency and explainability of AI operating mechanisms in the automotive industry. Automotive AI systems should strive to be as understandable and interpretable as possible, ensuring that users and relevant parties can understand the system's operating mechanisms.

Improve Living Conditions

We advocate that AI technology in the automotive industry should aim to improve human living conditions. By leveraging AI technology to enhance vehicle safety and road capacity, traffic safety and the rights of participants can be safeguarded, while building a more efficient transportation system that also protects other road users and the environment, thus promoting sustainable development of the automotive and related industries.

Protect User Privacy

We advocate that AI technology in the automotive industry should respect the privacy and safety of individuals. The entire life cycle management of AI technology must meet ethical standards and legal regulations regarding privacy. Data governance in the automotive AI sector should be strengthened to fully protect user privacy.

Respect Human Decision-Making

We advocate emphasizing human control over AI-equipped vehicles. In decisions involving personal safety and significant social impact, AI systems must not replace humans in making final decisions.



An aerial photograph of a curved asphalt road. A dark-colored car is driving on the road. In the background, there is a long, low building with a corrugated metal roof and a wooden door. The sky is a clear, deep blue. The overall scene is captured from a high angle, looking down at the road and building.

2

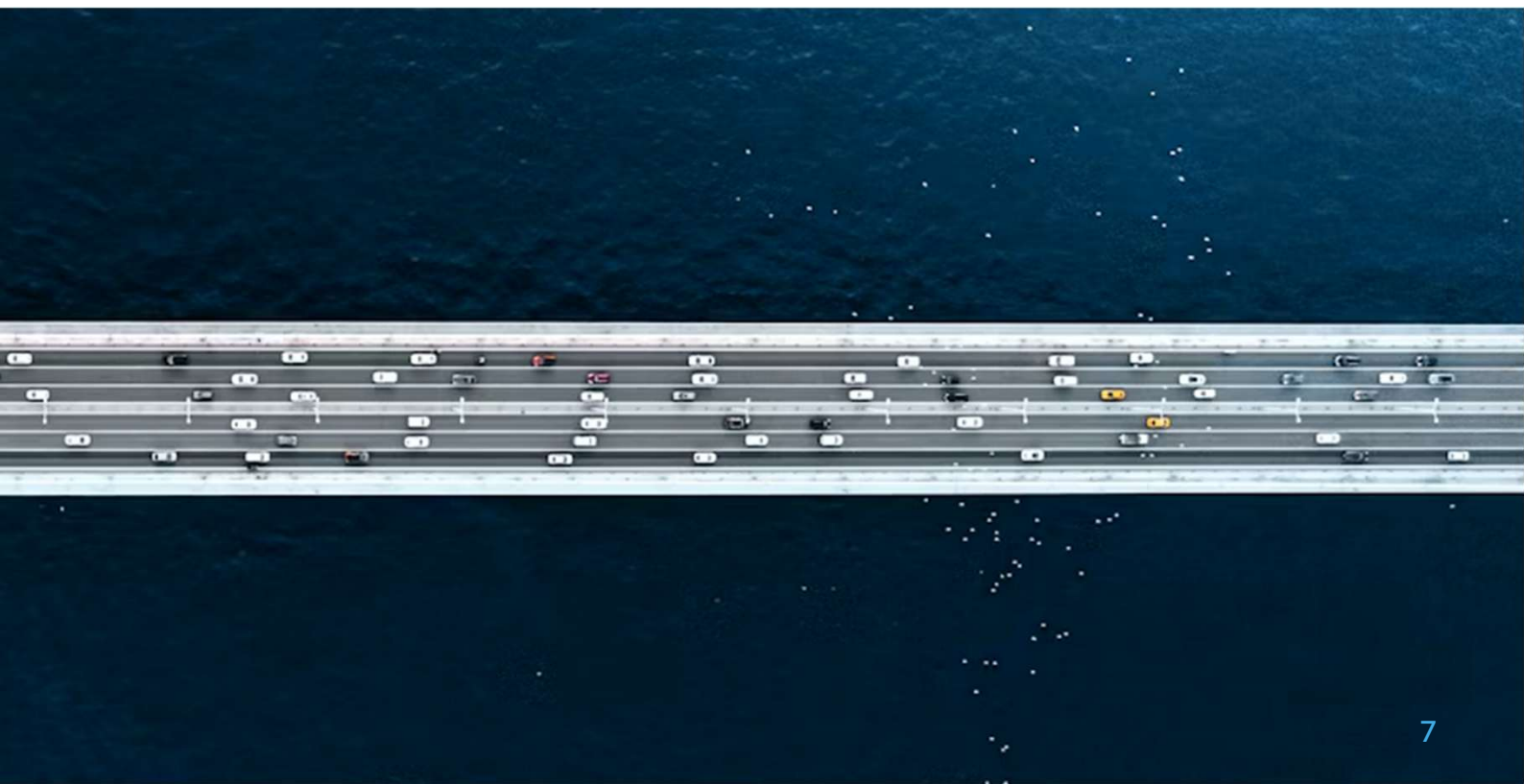
Strengthening Risk Prevention and Ensuring the Safety of People and Vehicles

Strengthening Risk Prevention and Ensuring the Safety of People and Vehicles

System Security and Coordinated Protection

We advocate for the development of trustworthy and responsible automotive artificial intelligence (AI), with continuous improvement of the security, reliability, and controllability of models and systems. Sustainable data acquisition frameworks that protect vehicle data privacy should be developed to facilitate the use of high-quality data for better training and validation of automotive AI models, thereby ensuring vehicle data security, system security, and safety with respect to external environments. In the development and application of generative automotive AI, we promote ongoing improvements to the controllability of models and the safety of generated outputs.

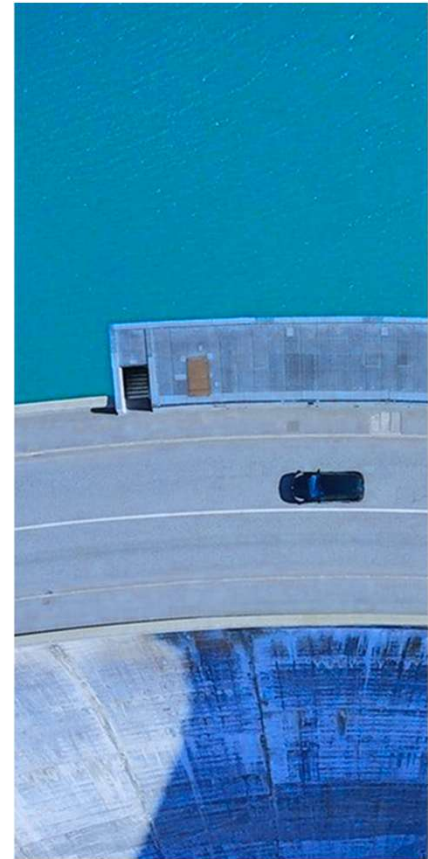
We advocate for the identification of AI security risks that are widely recognized in the automotive industry and the establishment of scientifically coordinated protection mechanisms. Security vulnerabilities in automotive AI systems should be discovered and reported, with the reporting mechanisms being convenient and effective. Professional response teams should be established to quickly assess and fix identified vulnerabilities. Attention should be paid to compatibility and stability during system updates to ensure that remedial measures do not negatively affect vehicles or equipment.



Safety Classification and Risk Prevention

We advocate for the establishment of safety risk classification strategies and testing and evaluation systems for automotive AI. This includes promoting classification strategies and testing frameworks that cover data and network security, functional safety, and safety of intended functionality, to enable categorized and tiered management.

We advocate for robust, reliable, repeatable, and standardized testing of systems to ensure the safety and reliability of automotive AI. During this process, safety measures will be applied and continuously reviewed to protect vehicle data. Prior to the release of automotive AI systems, security tests will be conducted to strengthen risk prevention and ensure model safety.



Public Awareness and User Application

We advocate for promoting public awareness and understanding of AI technology in the automotive industry, protecting the public's right to know and to make informed decisions. Public outreach should be strengthened to inform the public of both the social benefits and potential security risks arising from advances in automotive AI technology. This will help foster correct safety awareness of AI applications in vehicles and encourage full consideration of potential safety concerns, ensuring that the public can make informed choices.

We advocate for developers and users of automotive AI to adopt principles of responsible and prudent use. They should possess the necessary knowledge and capabilities to ensure that AI systems operate according to their design intent and operating conditions, fully recognize potential impacts, and avoid misuse and abuse.



3

Safeguarding Public Trust and Protecting User Privacy

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Enhancing Explainability

We advocate for improving the explainability of automotive AI systems to enable the public to better understand their decision-making processes. In automotive AI applications such as intelligent driving and smart cockpits, models with stronger explainability should be prioritized. The input-output relations and decision-making processes of AI algorithm modules should be explained as clearly as possible. Particular attention should be given to enhancing the explainability of AI systems that have a significant impact on driving safety, irreversible decisions, or high-risk situations.

Preventing Deceptive Attacks

We advocate for the continuous updating and improvement of anti-deception technologies to address the diversity and complexity of generative AI deception methods. In scenarios where deception risks may exist, advanced technologies should be developed and adopted to identify potential deceptive behaviors of automotive AI systems, provide fraud warnings, and ensure that users fully understand the deception risks before using system functions, thus protecting user interests.

Strengthening Privacy Protection

We advocate for safeguarding the data privacy of users of automotive AI systems. Data governance should be strengthened at the source, utilizing technologies such as data traceability, data watermarking, and identity authentication to prevent illegal data collection, tampering, misuse, and leakage. Compliance, integrity, and security of data must be ensured, and an efficient, secure, and reliable privacy protection system for automotive AI should be established.

A wireframe helmet, resembling a VR headset, is rendered in glowing blue lines and nodes against a dark blue background with a network of light blue lines and dots. The helmet is positioned in the upper half of the frame, with its reflection visible below. A solid blue rectangular bar is located on the side of the helmet.

4

Enhancing Responsibility Awareness and Exploring Governance Pathways

Enhancing Responsibility Awareness and Exploring Governance Pathways

Strengthening Accountability

We advocate for the establishment of a comprehensive AI safety responsibility system, with clearly defined responsibilities to promote the safe, stable, and sustainable development of automotive AI. Enterprises should build internal responsibility systems, improve security, assessment, and evaluation mechanisms, and clarify responsibilities of all parties involved. Responsibility awareness should be strengthened, and the cognitive level and professional competence of enterprises and practitioners in AI technology should be improved to ensure compliance with relevant standards and regulations during technology application.

We advocate for all stakeholders involved in automotive AI technology to shoulder corresponding social responsibilities and establish appropriate safety assurance mechanisms to address issues related to driving safety, intelligent transportation, and others. Ethical, legal, and social risks and potential hazards should be fully considered, reduced, or avoided as much as possible. A trustworthy automotive AI ecosystem should be built to promote the application and adoption of automotive AI technologies.

Promoting Industry Governance

We advocate for the establishment and improvement of effective supervision mechanisms to monitor and ensure the normal operation of systems and provide timely responses to problems. Collaboration models with regulatory agencies should be explored, along with clearly defined responsibilities and accountability mechanisms, to ensure that system operation not only complies with ethical values and legal requirements but also gains broad social recognition and support.

We advocate for the industry to actively improve self-regulation mechanisms. Enterprises should establish sound self-discipline codes of conduct, management norms, and evaluation rules, actively accept public supervision, and promote healthy industry development.



5

Promoting Resource Sharing and Fostering Healthy Competition

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Multilateral Cooperation and Mutual Benefit

We advocate for active interdisciplinary, cross-sector, and global multilateral cooperation. We will embrace participation from all sectors of society with an open and inclusive attitude, pooling wisdom and resources from all parties. Governance experiences and best practices will be shared to promote the innovative application of automotive AI technologies, establishing a healthy, sustainable, and synergistic partnership to jointly address the opportunities and challenges brought by AI.

We advocate for respecting the interests and demands of all parties to achieve mutual benefit. The development of automotive AI involves the collaboration of vehicle manufacturers, component suppliers, research institutions, system users, and others. The interests of various participants should be fully respected and considered, jointly building a sound and efficient multilateral governance system.

We advocate for the active establishment of an open information resource sharing mechanism for automotive AI, regulating data usage and circulation. Through cooperation and communication with renowned researchers and technical experts, data silos will be broken down to create an efficient collaborative data sharing mechanism, while ensuring the authenticity, accuracy, and integrity of data. Technologies such as data encryption and access control will be adopted to ensure data security during sharing, clarifying responsibilities and obligations, limiting sharing scope and recipients, and preventing data misuse or leakage.

We advocate for building an automotive AI resource-sharing platform based on the protection of intellectual property rights, to achieve effective allocation and efficient utilization of resources. By sharing information resources through open platforms, technological innovation and R&D capabilities as well as basic software and hardware services will be enhanced. The open-sourcing of general-purpose software and technologies will be encouraged to promote the dissemination, transformation, and application of automotive AI technological achievements.

Open Resources and Information Sharing

Innovation- Driven Development and Healthy Competition



We advocate for breakthroughs in core automotive AI technologies to achieve innovation-driven development. Increased investment in scientific research and financial support for automotive AI research should be provided to promote key technology development. Collaboration between universities, research institutions, and enterprises should be encouraged to establish joint laboratories, R&D centers, and innovation alliances, facilitating the transformation and industrialization of AI technological achievements in the automotive sector.

We advocate for building a fair and open environment for healthy competition in the automotive AI industry. Malicious competition will be prevented to jointly safeguard healthy industry development. By encouraging healthy competition, participants can learn from one another, progress together, and continuously improve the technological level and innovation capabilities of the entire industry.





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Building Industry Consensus and Developing a Standard System

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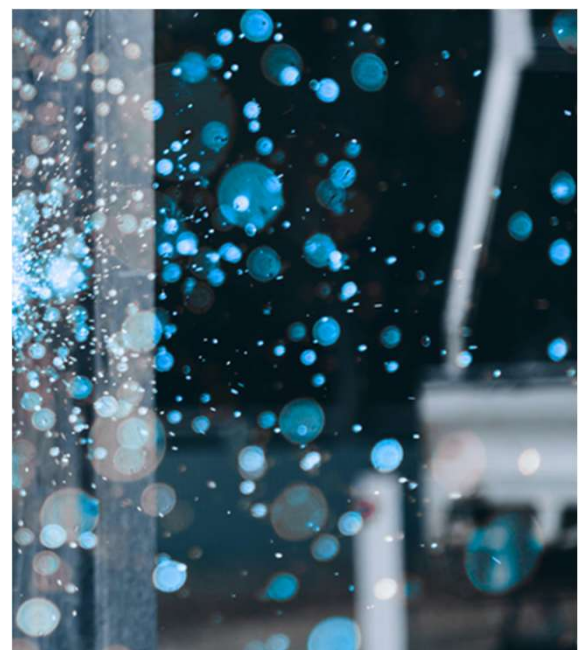


Industry Demand-Driven Development

We advocate for fully respecting the objective laws of automotive industry development and leveraging standards to guide the development of new products, business models, and formats driven by AI technologies. The leading role of automotive enterprises in technological innovation and product commercialization will be emphasized, while standards will provide forward-looking guidance for AI technological innovation and industrial development, offering high-level standards and goals for AI-based automotive product development, application, and management.

Establishing Technical Baselines

We advocate for fully utilizing the foundational role of standards in ensuring technological safety, efficiency, and interoperability during the development of automotive AI. Technical standards will be systematically and orderly formulated to gradually cover multiple aspects of vehicle performance, safety specifications, ethical guidelines, and the entire industry chain. Standards will regulate activities in typical AI applications such as intelligent driving and human-machine interaction, laying a solid development foundation and continuously protecting user rights, thus promoting the healthy and sustainable development of AI technologies in the automotive industry.

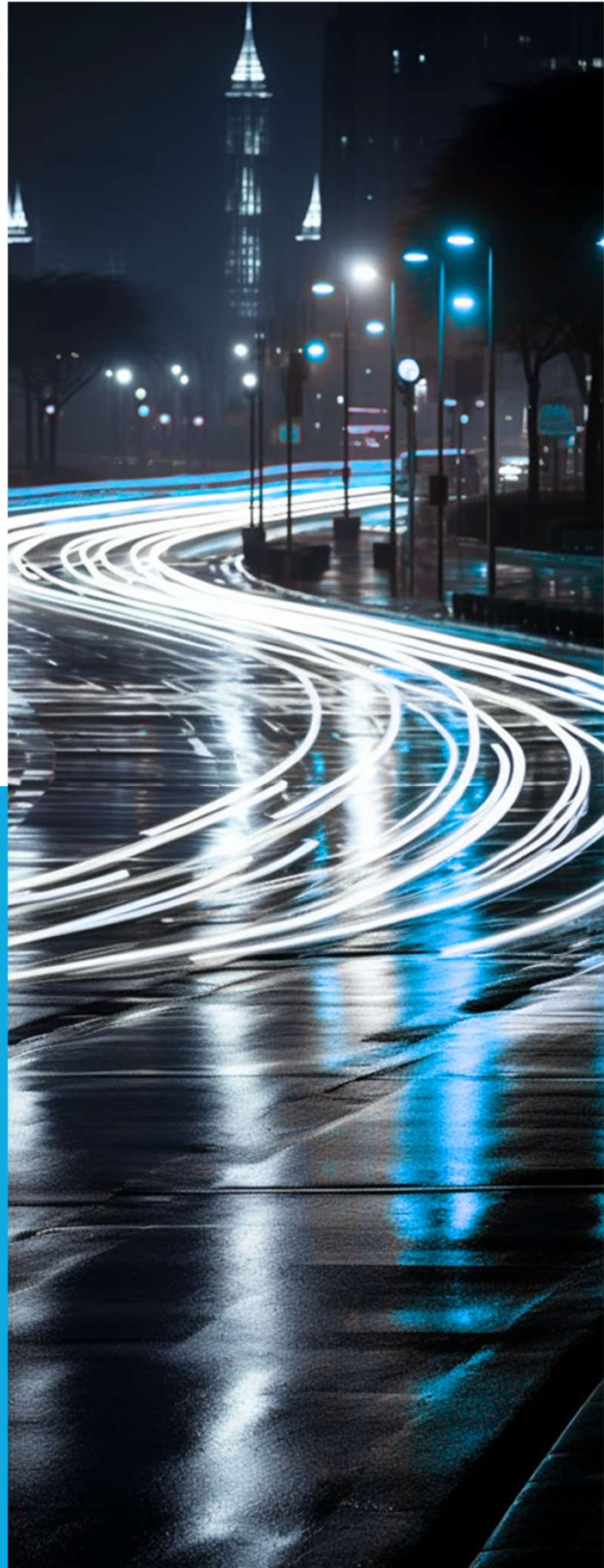


Shaping Standard Quality

We advocate for enhancing the scientific and practical nature of automotive AI technical standards. On the basis of following general AI technology standards, high-quality AI standards tailored to and for the automotive industry will be developed. The technical content and indicators will be based primarily on China's industrial development while remaining compatible with international standards, regulations, and general global rules. Innovation demands will be reflected, diversity will be respected, and unnecessary restrictions on technical paths will be avoided. During standard development, relevant standardization procedures will be followed, extensive industry consultation will be conducted, and broad, durable consensus will be reached.

Joint Standards Development

We advocate for transforming industry consensus on automotive AI development into a technical standards system. Guided by the principles of forward-looking planning, urgent priorities, and bottom-line guarantees, a roadmap for standardized automotive AI development will be established. Through active participation in domestic and international standardization organizations, industry associations, and academic institutions, multilateral cooperation and cross-sector collaboration between government departments, enterprises, and research institutions will be strengthened to address current challenges and common problems, continuously advancing the standardization of automotive AI technologies.



Summary

This initiative addresses the current development status of artificial intelligence (AI) in the automotive industry, focusing on the risks and challenges the industry faces. It proposes a “5+1” standardized development initiative for automotive AI technologies, comprising five key focus areas (Ethical Norms, Risk Prevention, Public Trust, Supervision and Governance, Cooperation and Competition) plus one standardized development roadmap.

Ethical Norms serve as the moral foundation of AI development in the automotive sector, aiming to improve human quality of life and enhance social well-being.

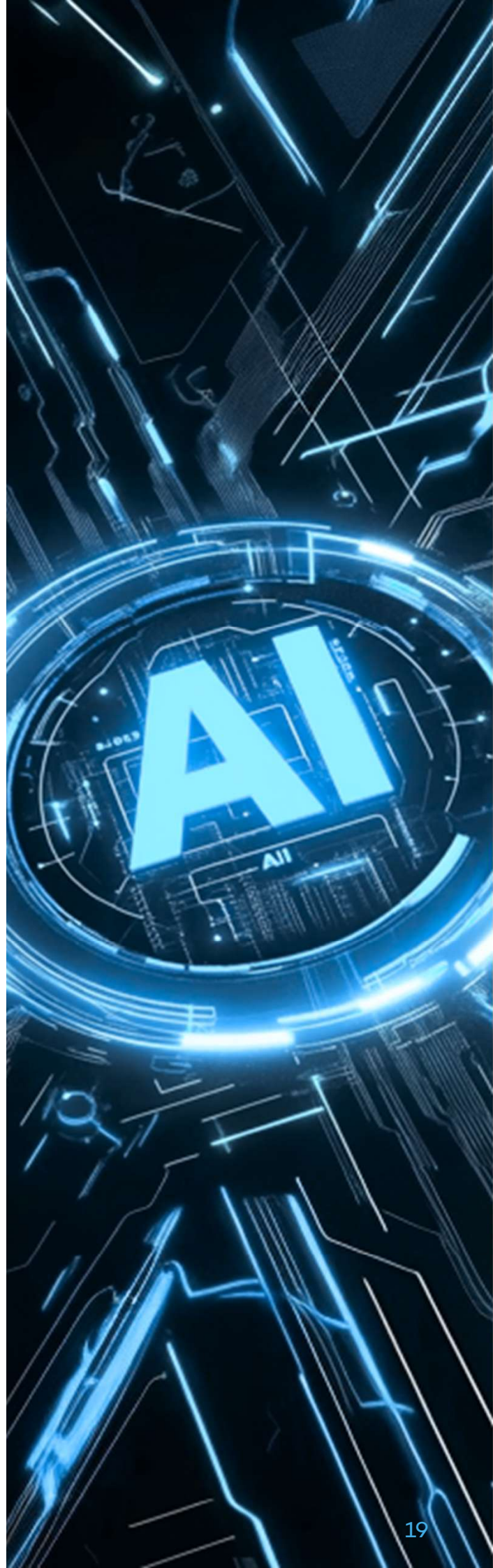
Risk Prevention is the basis of safety, where human safety is always prioritized to ensure system security and reliability.

Public Trust forms the foundation for popularization, emphasizing improved AI system explainability, prevention of deception attacks, strengthened user privacy protection, and maintenance of public trust.

Supervision and Governance constitute the management foundation, focusing on establishing robust responsibility and accountability systems, promoting industry governance, and building a trustworthy automotive AI ecosystem.

Cooperation and Competition are the collaboration foundation, promoting mutually beneficial, open, and inclusive industry cooperation, actively sharing technology resources and information, and fostering a fair, open, and healthy development environment for automotive AI.

The automotive AI technology standard system and roadmap will be constructed and continuously improved based on these five key focus areas, playing a fundamental, guiding, and regulatory role.



Acknowledgements

— We must acknowledge that

deeply empowering the automotive industry with AI technologies for high-quality development still faces many challenges and a long road ahead.

— We also recognize that

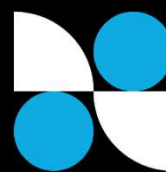
the wave of AI-driven industrial evolution in the automotive sector is irreversible and inevitable.

— We firmly believe that

AI technology will actively contribute to deep transformative changes in human mobility, help build a better future automotive society, and benefit every individual within it.

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