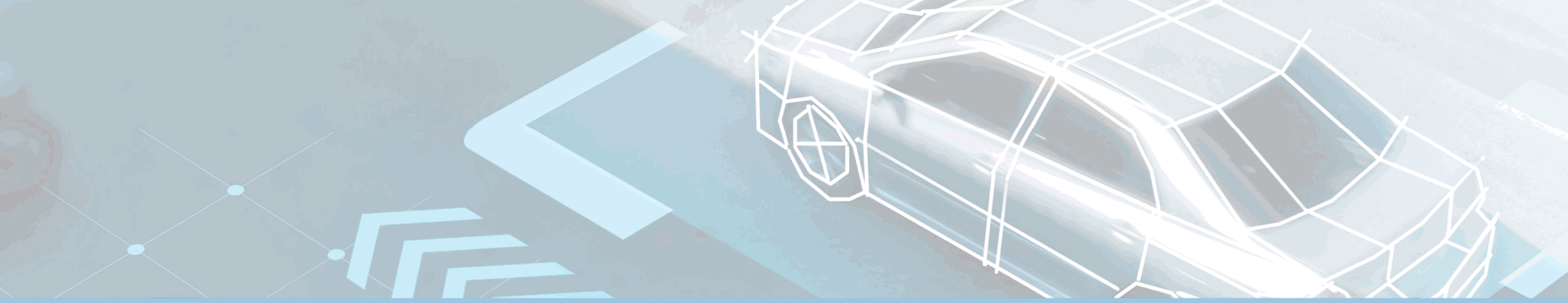

자율주행시범지구 운영위원회 주관 광역지자체 세션

세계 11위를 달성한 한국형 자율주행 모델의 가능성

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A Study on the Value and Potential of the Korean Autonomous Driving Model : The Global Emergence of Autonomous a2z

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Key Words : Autonomous Vehicles(자율주행차), Autonomous Business Model(자율주행사업모델), New Industries(신산업), AI(인공지능), MobilitY(모빌리티), B2B homologation regulation(기업간거래 인증제도)

ABSTRACT

In the rapidly evolving autonomous vehicle (AV) landscape, Korea's Autonomous a2z (A2Z) presents a compelling case of how a mid-sized, vertically integrated company can attain global recognition through technological self-reliance and strategic policy engagement. As of 2024, A2Z ranks 11th in the Guidehouse Insights Autonomous Vehicle Leaderboard-the highest among non-U.S. and non-Chinese firms and the only Korean entity in the top 20.

Founded in 2018 by engineers with extensive experience in mass-market vehicle development, A2Z has developed a comprehensive AV stack encompassing software, sensors, vehicle control units, and integrated platforms. The company operates 15 vehicle models, holds the highest number of AV operation permits in Korea, and has accumulated over 579,000 km of public road testing across 14 deployment regions. It has also secured over KRW 82 billion in Series C investment, positioning it among the most capitalized AV startups in Asia.

A2Z 's policy leadership has been equally significant. In 2024, Korea enacted its first Level 4 AV performance certification framework, enabling B2B transactions for public mobility and logistics. A2Z was a key proponent of this regulation and is expected to be the first certified operator under the new legal regime.

This study explores how A2Z's trajectory offers a new blueprint for AV ecosystem development beyond the U.S.-China binary. Through modular system design, targeted B2B applications, and policy co-creation, the Korean AV model-as exemplified by A2Z-demonstrates a viable path for smaller nations to achieve competitive standing in the global autonomous mobility market.

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Overview of RideFlux's Technology

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Key Words : Autonomous driving(자율주행), RideFlux(라이드플럭스), Artificial Intelligence(인공지능)

ABSTRACT

RideFlux is a leading autonomous driving technology company in South Korea, focused on developing safe, scalable, and reliable self-driving software solutions. Our core technology stack is designed for real-world deployment, especially in urban and semi-urban environments such as Jeju Island, where diverse traffic dynamics and adverse weather conditions demand highly robust autonomous systems. RideFlux's autonomous driving system is built on a robust sensor fusion framework combining LiDAR, radar, and camera vision, enhanced by AI-driven perception algorithms to enable high-resolution understanding even in adverse conditions. Our full-stack development includes data labeling infrastructure, HD mapping, behavior prediction, planning, and control modules, as well as remote monitoring and fallback support systems — all optimized to function within geofenced environments for reliable autonomous service.

RideFlux leverages advanced AI technology across its autonomous driving stack to enhance environmental understanding and decision-making. Our perception system incorporates deep learning techniques for anomaly detection, enabling the vehicle to identify and respond to unusual obstacles such as fallen branches or construction debris. AI is also applied in camera-based depth estimation and camera-LiDAR fusion, allowing for more accurate 3D scene understanding. In addition, AI-based control can play a key role in vehicle dynamics, such as minimizing rollback when a heavy truck restarts on an uphill slope — ensuring smoother and safer operation in urban driving. AI can also be utilized for road surface analysis, such as detecting contamination or debris that could impact specialized applications like autonomous road sweeping. By continuously learning from diverse driving data, our AI pipeline not only adapts to adverse weather conditions but also enables domain-specific functions beyond standard driving, reinforcing our mission to deliver autonomous mobility solutions that are intelligent, safe, and ready for the real world.

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로보택시 안전성 확보를 위한 자율주행 기술 수준과 전국 지역 확장의 필요성

김기혁* · 류양호** · 성종훈*** · 강정식***

The Level of Autonomous Driving Technology to Ensure Robotaxi Safety and the Need for Nationwide Expansion

Kihyuk Kim*, Yangho Ryu**, Jonghoon Sung***, Jungsik Kang***

Key Words : Autonomous driving(자율주행), Robotaxi(로보택시), Edge case(엣지케이스), End-to-End(E2E 학습), Sensor-fusion(센서 융합)

ABSTRACT

As autonomous driving technology advances, ensuring its safety in real-world deployment remains a critical challenge. SWM has developed and deployed Robo-taxis in Seoul's Gangnam district—a highly complex urban environment—to validate its autonomous driving capabilities. The system integrates a high-performance computing platform exceeding 1,000 TOPS with a heterogeneous sensor fusion framework, enabling reliable perception of challenging edge cases such as unprotected turns, illegal parking zones, and narrow lanes.

To enhance safety and generalization, SWM has transitioned from modular rule-based logic to an End-to-End (E2E) learning approach. This framework relies on large-scale, real-world driving data to directly map sensor inputs to driving actions. The effectiveness of E2E learning, particularly for handling rare and long-tail scenarios, depends on acquiring diverse edge-case data. SWM addresses this through a nationwide expansion strategy, deploying Robo-taxis across varied cities and conditions—nighttime, rain, congestion—to systematically collect high-quality training data.

In addition to real-world data acquisition, SWM employs automated labeling and high-speed distributed learning infrastructure to shorten model retraining cycles. This data-driven loop of deployment, collection, and refinement allows for scalable improvements in autonomous behavior and safety assurance.

By combining field-proven hardware and software with a nationwide data strategy, this work demonstrates a practical pathway toward Level 4 autonomous driving. The ability to generalize across geographies and edge conditions is essential not only for technical robustness but also for regulatory and social acceptance, paving the way for commercial Robo-taxi operations across Korea.

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