

An aerial photograph of a dark-colored car on a road. Concentric orange circles emanate from the car, representing sensor waves. To the right of the car, a person is riding a red bicycle across a crosswalk. Further right, another person is walking across a crosswalk. The background shows a road with white lane markings and a sidewalk with a circular manhole cover.

DRIVING AUTONOMOUS SYSTEMS VALIDATION (DASV) WITH AWS

DASV Architecture on AWS

Capgemini 



Mobility is transforming the automotive industry

- On-demand and alternative consumer transportation needs represent a vast automotive shift
- New mobility services highlight the need to reinvent existing business models
- The advanced driver-assistance systems (ADAS) global market will increase from \$27 billion in 2023 to \$83 billion by 2030 (*Forbes*)
- A study funded by the AAA Foundation for Traffic Safety found that ADAS could save 250,000 US road lives over 30 years (*Automotive News*)

Autonomous vehicle adoption will be sequential

- Gradual introduction of multiple, inter-related safety technologies and functions
- Feature by feature, these technologies add new capabilities for safer vehicles
- New advanced driver-assistance systems (ADAS) features are already a differentiating factor
- Introducing new features increases the pressure on time-to-market and cost

Achieving trust at the right cost is one of the hardest challenges facing automotive players

- The enormous number of test scenarios needed to achieve the required level of confidence.
- The scale and complexity of data processing, pipeline, and infrastructure are non-linear and increase constantly.
- The spiraling cost of adapting systems to numerous vehicle variants for OEMs and Tier-1s struggling to achieve substantial savings on development costs.
- Achieving predictable time-to-market and ensuring deadlines are respected for validation.
- Adopting emerging technologies that require specific skills, in a tough labor market.

A VEHICLE FLEET TO
CAPTURE DATA



INGESTION &
PROCESSING PIPELINE



FUELING SIMULATION
ENVIRONMENT

CAPGEMINI POWERS
AUTONOMOUS DRIVING
FROM CAR TO SIMULATION

How does **DASV** accelerate validation time?

MINI LOGGER



Real-time test drive monitoring

RANGER



Annotation and labeling

TRACKSTER



Test drive management

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Capgemini's capabilities

OEMs and other suppliers are struggling to validate driving autonomous systems, as both complexity and new safety regulations increase. The deployment of ADAS and autonomous driving is being accelerated by the key integration of the ADAS system, a software-driven vehicle platform, and a new generation of sensors.

Autonomous mobility will create immense value to the automotive industry, but will require vast amounts of data. Automotive players will need to shift from a big data approach to focus on data quality. As a result, the development process has become even more reliant on data analysis.

Capgemini Engineering provides a global and fully automated verification and validation platform powered by AWS, and its Global Training Center upskills and trains engineers. We also offer a turnkey function-development process and act as an integration partner.

Powering automation

Utilizing DASV architecture on AWS, we're able to power autonomous driving from car to simulation.

Our team captures real-world data using a vehicle fleet and AWS' ingestion and processing pipeline to fuel simulated environments.

Function development

Capgemini develops various ADAS features to address different levels of autonomy (L1, L2, L3, L4) in a turnkey model or as an integrator.

Our team leverages our experience from Capgemini Engineering's internal research and innovation (R&I) program.

Driving automation system validation

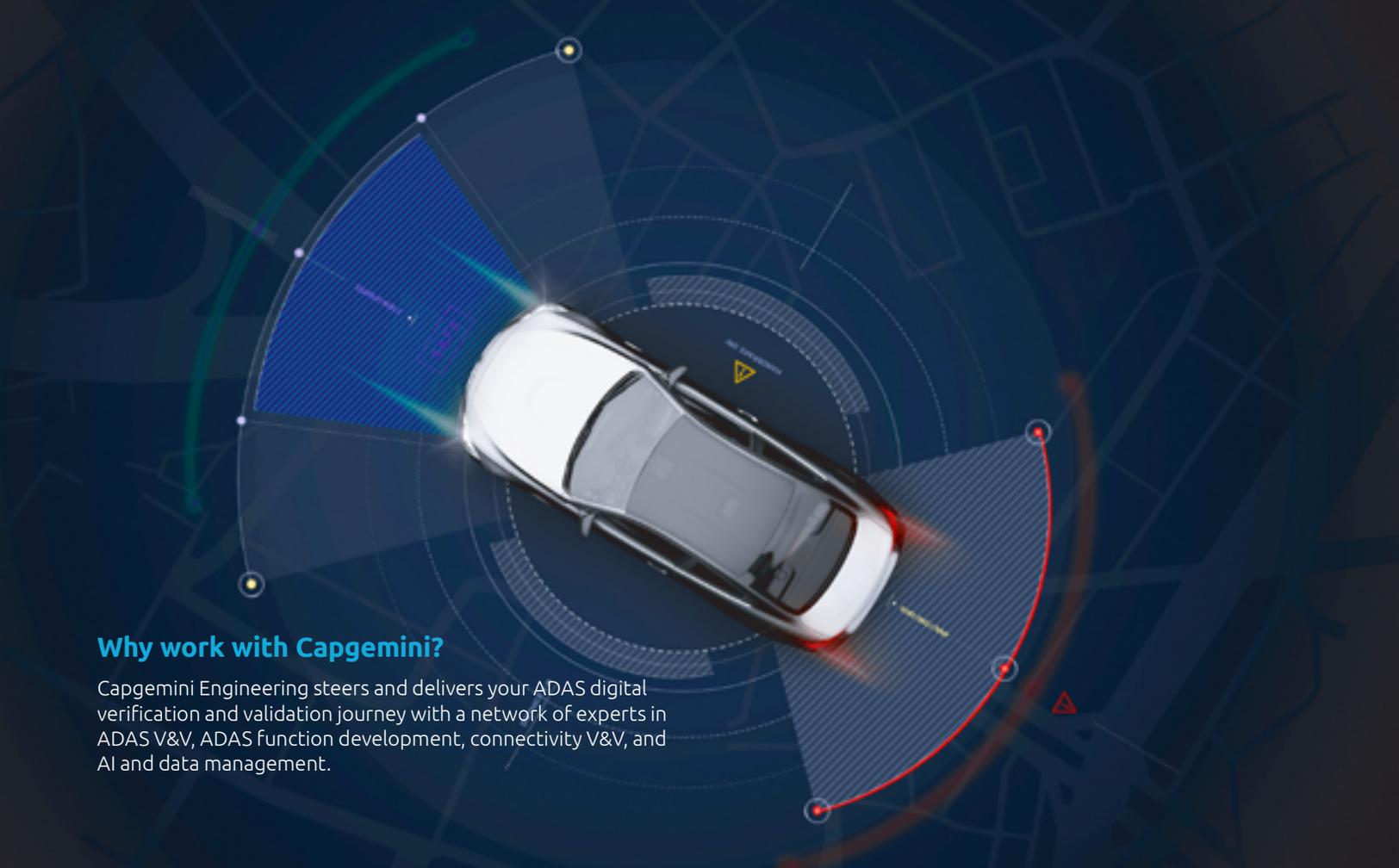
Our Driving Automation System Validation (DASV) platform is an integrated end-to-end solution for ADAS and AD validation. We accelerate validation time by implementing our Mini Logger, Ranger, and Trackster tools, which rely on AWS for execution.

The automation of activities for V&V is supported by DAVSV handling everything from data production and homologation support to XiL validation.

Global training center

Emerging autonomous-driving technologies require dedicated skills, and we provide a full training path to upskill team members.

Training is remote, provided by a world-class team of experts, and includes dedicated case studies and examples.



Why work with Capgemini?

Capgemini Engineering steers and delivers your ADAS digital verification and validation journey with a network of experts in ADAS V&V, ADAS function development, connectivity V&V, and AI and data management.

A global footprint

- 25,000 automotive consultants, of which 1,000 are dedicated to ADAS/AD
- 1,045 experts covering ADAS V&V and functional development
- Data collection campaigns operated in more than 60 countries
- Five automotive test centers in Europe and North America

Modular platform architecture

We offer a global team with state-of-the-art knowledge of the specific market, fostering internal R&I and university collaborations.

Integration, automation, and AI

The high level of automation achieved with advanced AI allows us to accelerate developments with tool-chain integration to build a scalable infrastructure to cope with large amounts of data.

An expert training path at a worldwide level

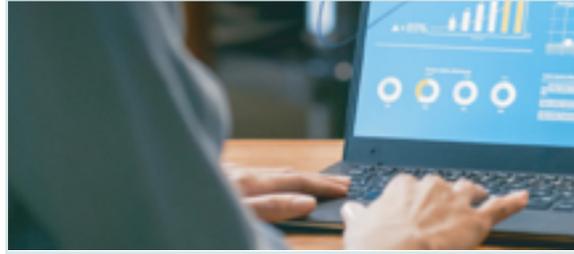
- More than 25 international experts provide a full training path, such as ADAS architecture trends, safety regulation, and model-based systems engineering (MBSE).
- With an average of 15 years of experience, the training team gathers all our expertise.

Use cases



Run real data collection campaigns and produce virtual simulations

On-the-road sensor data collected in 60-plus countries across Europe, North America, and Asia, complying to country regulations



Store and manage augmented data process from data ingestion to scenario creation

Data storage and improvement of data quality in the context of highly autonomous driving homologation file production



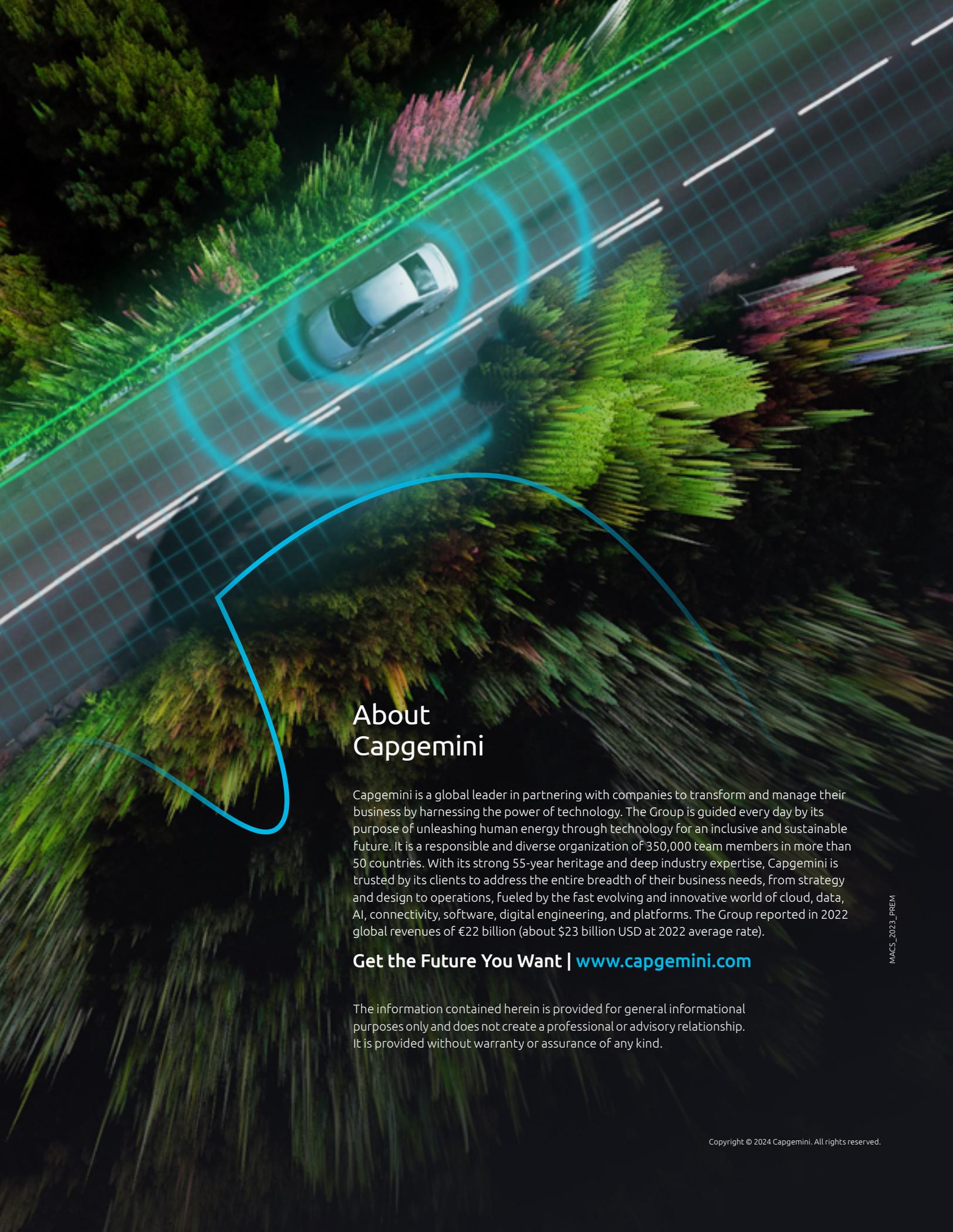
Define test strategy and automate test orchestration

Design and deployment of V&V test system leveraging automation to ensure fast and reliable ground truth data, improved measurement, and automated result evaluation



Define infrastructure strategy and provide scalable hybrid cloud solutions

Industrialization of data on client premises and cloud platform to handle large amounts of data while enabling high productivity and data safety



About Capgemini

Capgemini is a global leader in partnering with companies to transform and manage their business by harnessing the power of technology. The Group is guided every day by its purpose of unleashing human energy through technology for an inclusive and sustainable future. It is a responsible and diverse organization of 350,000 team members in more than 50 countries. With its strong 55-year heritage and deep industry expertise, Capgemini is trusted by its clients to address the entire breadth of their business needs, from strategy and design to operations, fueled by the fast evolving and innovative world of cloud, data, AI, connectivity, software, digital engineering, and platforms. The Group reported in 2022 global revenues of €22 billion (about \$23 billion USD at 2022 average rate).

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