CloudGeometry

Revolutionizing Road Safety: CloudGeometry's Real-Time Dashcam Solutions

Case Study

Onward

aws partner network

SaaS Architecture Competency

Transforming road safety with cutting-edge dashcam technology & real-time object detection

Learn how CloudGeometry's innovative dashcam technology and real-time object detection are making roads safer for drivers and pedestrians. Explore their journey towards creating a digital twin of cities and optimizing traffic patterns.

Onward

INDUSTRY

AI and Machine Learning, Data Analytics and Big Data, Edge Computing, Public Safety, Automotive Technology, Mobile Application Development

SOLUTION

Transform everyday dashcams into real-time information hubs, utilizing cutting-edge object detection technology to provide drivers with crucial insights, making roads safer for everyone.

CLIENT

Nexar

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A technology company specializing in building digital twins and safer cities in Japan and South Korea is focused on making driving safer for both drivers and pedestrians. As a leading innovator in the automotive technology space, they specialize in designing advanced dash cameras with smart image capture and networking capabilities. These devices translate driver experience behind the wheel to aggregated, searchable knowledge describing up-to-date characteristics of roadway conditions and behaviors. They also collaborate with insurance companies to let drivers benefit from safer driving.

To do that, the company needs to create a network of alerts and insights as to what drivers are seeing in order to provide the information needed to create a real-time view of the conditions within and around a city.

The Challenge

The company's goal is to develop a cloud service that aggregates information from individual dashcams to provide a holistic view of an environment, enabling drivers to coordinate their movements, resulting in safer roads. To make that happen, they needed to enable their dashcam products to identify a variety of traffic situations.

These situations included the full range of things a driver might see, from a traffic sign to an open parking space to traffic blocking their path. In addition, their goal was to provide this information in an easy-to-consume way, such as an overlay for Google Maps or OpenStreetMap's.

And all that information needed to be processed in real-time.

Realtime AI/ML video analysis	Machine learning model building, training, and optimization to enable object detection
Mobile application development	Integration of dashcam data with Android and iOS apps for full user experience
Full edge computing architecture	Data pre-processing at edge nodes with data aggregation at regional and central servers to provide overall benefit for all users

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The Solution

Real-time object detection from dashcams, like those in autonomous vehicles, requires a chain of data and applications. CloudGeometry's experience with complex environments, combined with its experience in AI and machine learning as well as mobile applications, made it perfect for this project.

Starting at the edge, CloudGeometry used frameworks such as Tensorflow Lite and Flutter to capture real-time video from dashcams. They created an app that performs object detection at the edge. This app then returns bounding boxes for detected objects. These objects included:

- Traffic signs
- Parking lots and spaces
- Accidents
- Traffic slowdowns
- Cones, barrels, and other signs of road construction

CloudGeometry built the software that transmitted these results over Bluetooth to the user's device, integrating with the company's main app for the full user experience.

All of this is important to users, but it is only part of the company's mission. This data is also sent to centralized servers, where a new robust data pipeline enables it to be digested and aggregated so that the company can create a digital twin of a city. From there, they can advise drivers of conditions before they get there, enabling them not just to arrive sooner, but to drive safer. They can also provide additional services to the city and to third parties.

Key technologies that made the solution possible included GeoJSON, H3, OSM, Snowflake, ElasticSearch, ScyllaDB, Kafka, Databricks (Spark), and S3.

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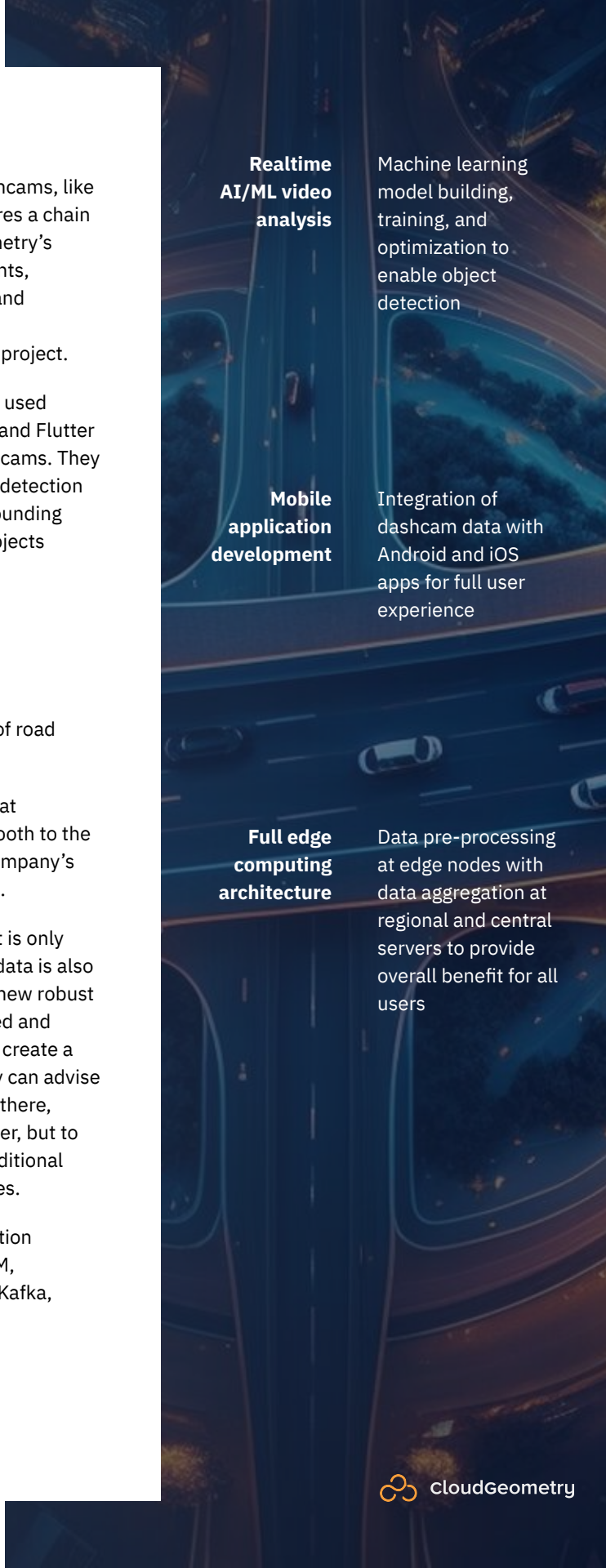

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The Benefits

The client's business is based on providing digital twins of cities based on the feeds received from their dashcams. By providing real-time analysis of the video these cameras receive, CloudGeometry enabled the company to give customers the full experience promised by the technology. It also enabled additional lines of business, such as providing information to insurance companies to enable driver benefits for safer driving, and aggregate driver behavior information for cities trying to optimize traffic patterns.

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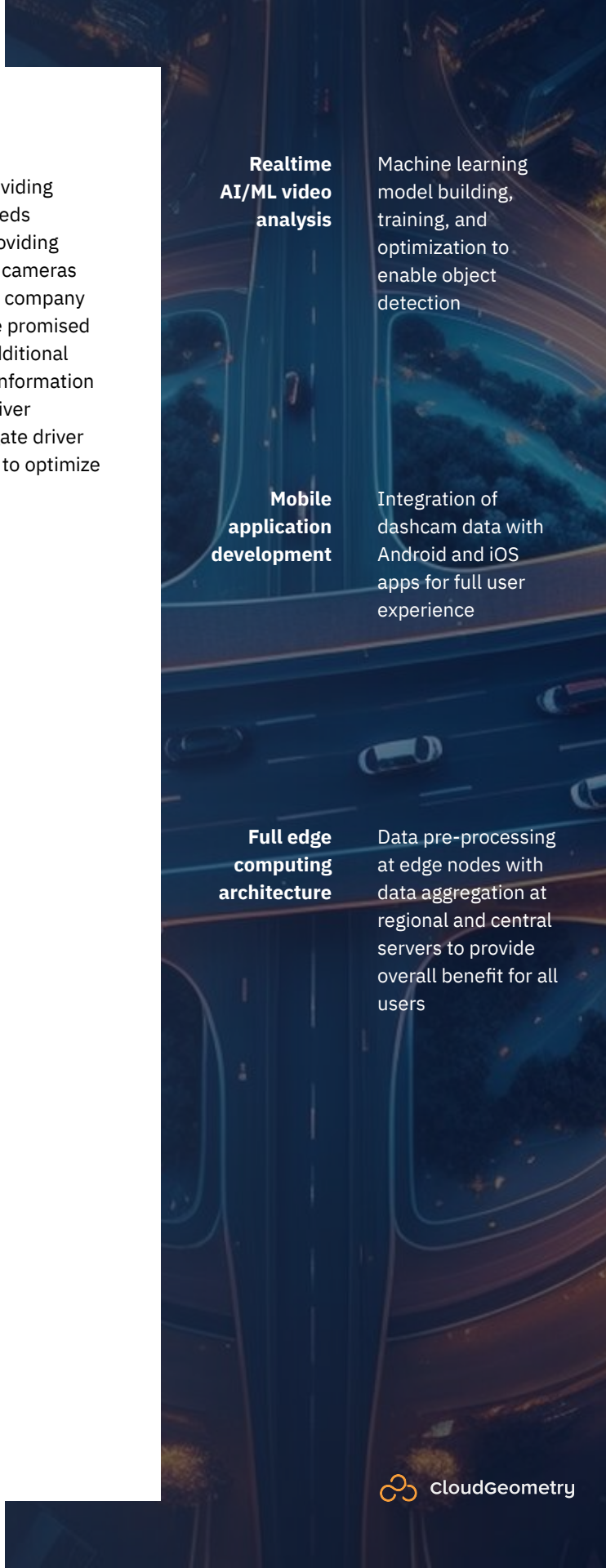

CloudGeometry

Technology Solutions & Services to build, optimize and run your cloud software and operations.

cloudGeometry

TECHNOLOGY SOLUTIONS

APPLICATION MODERNIZATION
Transform Legacy Systems for Future-Ready Innovation

AI & DATA
Achieve breakthrough automation and analytic insights via cutting-edge data strategies

CLOUD COST MANAGEMENT
Optimize Cloud Spending for Maximum ROI and Efficiency

SECURITY AND COMPLIANCE
Reinforce your cloud infra, workload, operations, and development end-to-end

FOUNDATION SERVICES

CLOUD INFRA & OPS
Robust Infrastructure Solutions for Seamless Operations

- DevOps as a Service
- Managed Cloud Operations
- Cloud Spend Optimization
- Resilience, Continuity & Backup
- AWS Well-Architected

MODERNIZATION & MIGRATION
Smooth Transitions to Modern Architectures with Minimal Disruption

- Application Modernization
- Kubernetes Adoption
- AWS Database Migration
- Data Engineering Operations
- Data Integration
- Data Migration
- Cloud Migration & Adoption

ADVANCED SERVICES

CLOUD-NATIVE DEVELOPMENT
Build Scalable, Resilient Applications with Cloud-Native Technologies

- CI/CD
- Multi- Platform App Design & Development
- Cloud-Ready Teams
- Enterprise SaaS Modernization
- Multi-Tenancy SaaS
- B2B Customer Success Engineering

CLOUD-NATIVE OPERATIONS
Streamline Operations with Advanced Cloud-Native Practices

- Platform Engineering
- Workload Management
- Monitoring & Observability
- Infrastructure Management

AI/ML & DATA SERVICES

AI/ML & DATA
Leverage Advanced Analytics and Machine Learning to achieve exponential acceleration in the ROI of your data assets

- AI/ML Engineering for Data Analytics
- Generative AI
- Traditional ML for Data Analytics
- AI/ML Development and and Data Science
- Data Engineering for MLOps

CloudGeometry

CloudGeometry delivers expert technical services, helping our clients unlock the full potential of cloud-native open source tooling and commercial platform technologies.

With roots in Silicon Valley, we've seen firsthand what works (and what doesn't). Count on CloudGeometry to accelerate application modernization, Kubernetes adoption, developer enablement, secure multi-tenancy, AI/MLOps, DevOps automation and more.

- As **AWS Advanced Consulting** partners, our certified solution architects and platform engineers help address the range of challenges facing enterprise innovators and venture funded startups alike.
- The **Cloud Native Computing Foundation** has accredited us as a **Kubernetes Certified Service Provider**.
- We serve as charter contributors to the **Linux Foundation Data & AI Commons** (LF Data & AI), supporting a diverse, sustainable ecosystem for open source data and AI technologies.

Over the last decade, we've built and deployed hundreds of big, fast full-stack apps with well-engineered cloud infrastructure across industries: Financial Services, Industrial Automation, Healthcare, AdTech, Consumer-grade Mobile, smart devices, and more.

From enterprise upgrades to data engineering to cloud-native scale-out, CloudGeometry helps you plot the shortest path across all dimensions of modern cloud software engineering.

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- AWS Lambda
- Amazon Redshift
- AWS Database Migration Service

kubernetes CERTIFIED SERVICE PROVIDER

CLOUD NATIVE COMPUTING FOUNDATION

GENERAL MEMBER
LF AI & DATA
GENERATIVE AI COMMONS

CloudGeometry

Expert
Platform Engineering
& DevOps

Cloud Infrastructure
& Application
Modernization

AI & Machine Learning
Data Services

Open Source
Tooling & Integration

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