# Development and Integration of Advanced AUTOSAR Solutions for Adaptive Cruise Control

A leading software provider, serving global OEMs, faced the task of developing and validating an on-board system for Adaptive Cruise Control (ACC) against a pressing production deadline. This case study explores how Acsia leveraged its expertise in both classic and adaptive AUTOSAR, along with its proficiency in model-based development and ADAS solutions, to meet and exceed the client's expectations.

# Technology & Business Landscape

In 2021, the automotive industry saw significant advancements in AUTOSAR and Advanced Driver Assistance Systems (ADAS).

## AUTOSAR Trends

### Adaptive AUTOSAR

Greater flexibility and scalability through support for dynamic software updates, service-oriented architectures, and complex algorithms needed for autonomous driving.

### Classic AUTOSAR

Enhanced efforts to integrate Adaptive and Classic AUTOSAR platforms, improving resource management and communication.

### Cybersecurity Enhancements

Introduction of robust cybersecurity measures, including enhanced cryptographic algorithms and secure communication protocols to protect against cyber threats.

### Standardization Efforts

Focus on standardizing interfaces and communication protocols, fostering interoperability among manufacturers and suppliers, crucial for developing autonomous and connected vehicles.

## ADAS Trends

### AI and Machine Learning

Launch of innovative features like adaptive cruise control, lane-keeping assist, and pedestrian detection through Artificial Intelligence (AI) and Machine Learning (ML) algorithms.

### Sensor Fusion

Advances in sensor fusion technology, combining data from cameras, lidar, radar, and ultrasonic sensors, enhanced ADAS precision.

### V2X Communication

Progress in Vehicle-to-everything (V2X) communication technology, allowing vehicles to communicate with each other and infrastructure, enhancing situational awareness and supporting cooperative driving.

### Regulatory Compliance

ADAS developments influenced by evolving safety regulations and standards, ensuring enhanced safety and reliability.

# Customer Problem Statement

The software provider for global OEMs needed a partner to handle the software development and validation of an on-board system for the Adaptive Cruise Control (ACC) feature. Facing a tight production deadline, they required an experienced partner proficient in both Classic and Adaptive AUTOSAR to ensure timely delivery and high-quality integration.

# Acsia Solution

Acsia was chosen for its strong expertise in Classic and Adaptive AUTOSAR, critical for this project. The team handled:

- Complete software development and integration of a Classic AUTOSAR-based Safety platform, utilizing service-oriented architecture with SOME/IP services over Ethernet.

- Development of critical software components using the Elektrobit ACG stack, and model-based design for features like trajectory and localization.

- Software development and integration of an Adaptive AUTOSAR-based high-performance platform, including the NVIDIA Jetson board setup, integration of 3rd party cameras, GPS, IMU units, and implementation of trajectory planner based on object detection and sensor fusion algorithms.

- System testing and validation, with a key highlight being the realization of the Adaptive Cruise Control feature on an actual car based on open standards.

# Business Outcome & Impact

The client successfully met their tight production deadline. The partnership with Acsia enabled them to leverage advanced AUTOSAR and ADAS technologies, ensuring a high-quality and timely delivery.

# Key Learning

- Expertise in model-based development for the ADAS domain.
- Advanced skills in ADAS Active Cruise Control development.
- Proficiency in deploying both Adaptive and Classic AUTOSAR systems.

# Expert Speak

**Anil S**
VP Delivery

"Acsia's commitment to delivering high-quality solutions within tight deadlines was evident in this project. Our team's deep expertise in classic and adaptive AUTOSAR, coupled with our experience in model-based development, enabled us to meet the client's needs and exceed their expectations."

**Nibil P M**
AVP Advanced Technology Group

"Integrating the advanced features of both Classic and Adaptive AUTOSAR systems required a thorough understanding of the technologies and meticulous planning. Our team's ability to develop and validate complex systems like the Adaptive Cruise Control feature, while ensuring seamless integration, was a key factor in the project's success."

## About Acsia Technologies

Acsia is a global leader in automotive software powering Digital Cockpits & Displays, e-Mobility, and Telematics. We use our expertise to develop solutions that simplify complex problems and create safer, sustainable, and more compelling driver and passenger experiences. With a presence across the United States, Germany, Sweden, Japan, and India, we collaborate with top carmakers and Tier-I suppliers.
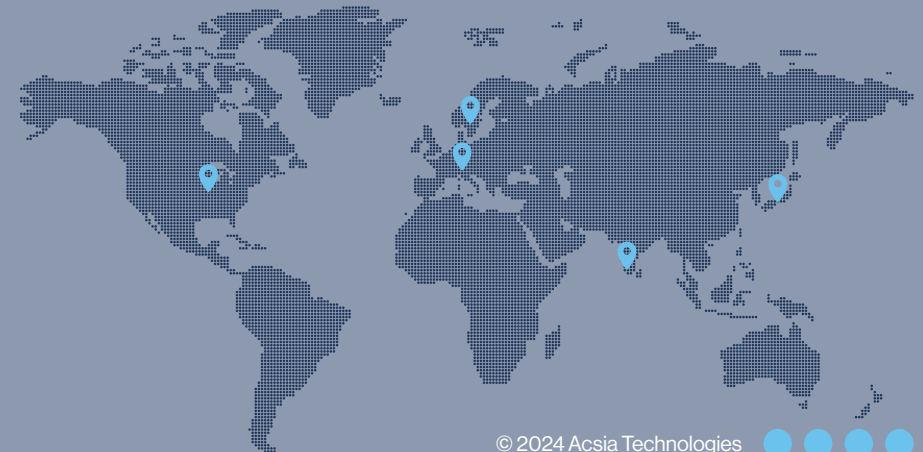
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