

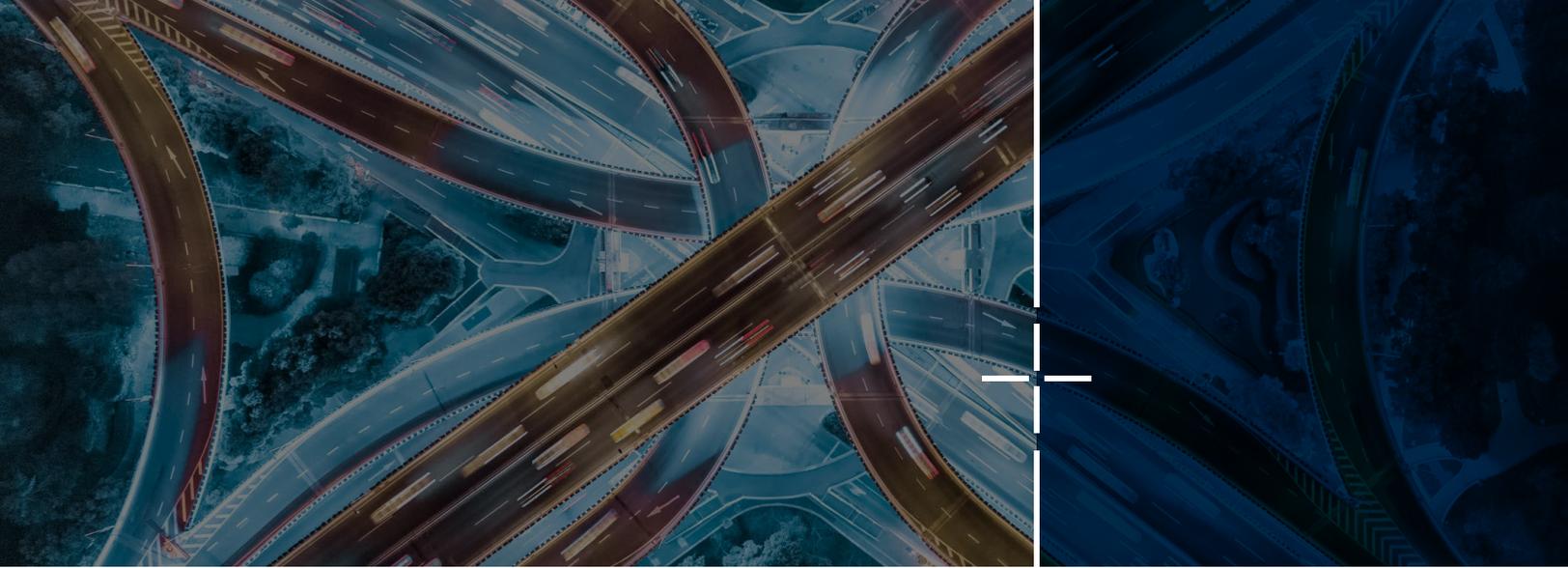
CASE STUDY

# A Leap Forward in Automotive Safety with LeddarTech and Arm

arm

LeddarTech





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## LeddarTech®

As the automotive industry evolves at an unprecedented pace, vehicle OEMs are under constant pressure to shorten development cycles and bring new technologies to market. One such innovative technology is advanced driver-assistance systems (ADAS) – a proven lifesaver. In U.S. alone, ADAS is estimated to prevent up to [62 percent](#) of total traffic deaths annually.

ADAS are a series of technology features that help to assist drivers using cameras and other sensors by detecting potential hazards, warning drivers, and even taking corrective action automatically.

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## The Challenge

However, as driver-assistance features become more prevalent across software-defined vehicles (SDVs), OEMs face pressures regarding the ongoing widespread adoption of ADAS in vehicles. These include:

- **Complex hardware platforms:** ADAS must work across various ECUs and configurations from legacy vehicle development. Scalability is crucial, as OEMs need ADAS to serve both high-end cars and volume segments, ensuring the software is compatible across all target platforms.
- **Integration complexity:** ADAS integration into existing vehicle architecture requires complex software coordination.
- **Global standards and regulations:** Different regions have different ADAS standards and regulations.



## Simplifying ADAS Adoption with LeddarVision™ on Arm

To streamline ADAS development and deployment, LeddarTech and Arm have joined forces to optimize [LeddarVision™](#), an AI-based sensor fusion and perception software stack. This software is designed to enhance vehicle safety and driver comfort by accurately modelling the environment in 3D, using advanced AI and computer vision (CV) algorithms.

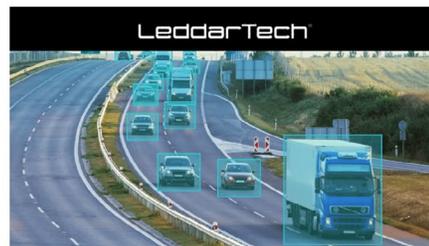
### Arm + LeddarTech Collaboration

Real-world ADAS perception optimized for next generation Arm CPUs

**Faster to Market**  
Arm v9 pre-silicon port  
for shorter time-to-market

**Reduced Perception Latency**  
Cortex-A720AE >30% faster than Cortex-A78AE  
on key ADAS algos, at same frequency\*

**Less CPU Utilization**  
More space left for integration  
of additional functions



\*Benchmarked using Arm internal Cortex-A720AE FPGA vs off-the-shelf Cortex-A78AE, based on cycle count.

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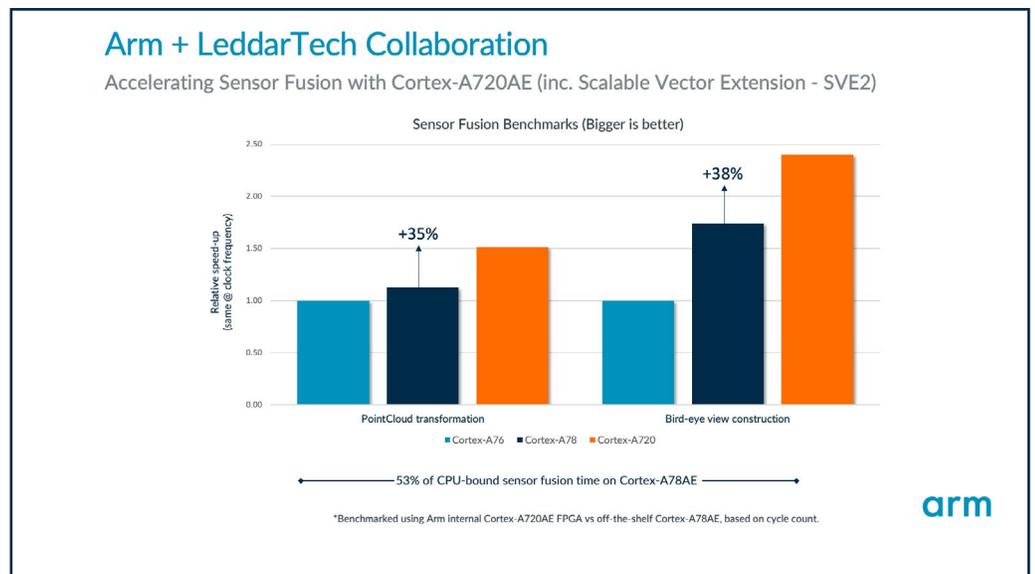
By building on Arm technologies, LeddarTech can make LeddarVision more efficient for OEMs and Tier 1 suppliers through:

- **Unified architecture:** Combining Arm's advanced CPU and accelerator technologies, LeddarVision works on a standardized ADAS software architecture, which can be easily adapted across various Arm-based automotive platforms, reducing the need for extensive customization.
- **Optimized performance:** LeddarTech and Arm have optimized critical performance-defining algorithms for upcoming Arm CPUs and accelerator technologies. This helps minimize computational bottlenecks and enhances overall system efficiency.



## The Arm Advantage in Driving ADAS Innovation

Arm's advanced CPU and accelerator technologies have played a crucial role in enhancing the efficiency of LeddarVision. By optimizing critical performance-defining algorithms within the ADAS perception and fusion stack for Arm CPUs, Arm and LeddarTech have minimized computational bottlenecks and enhanced overall system efficiency.



A key element in this process is the use of the [Arm Cortex-A720AE CPU](#). Compared to its predecessor, the [Arm Cortex-A78AE CPU](#), Cortex-A720AE supports more than a 30 percent performance increase in critical LeddarVision sensor fusion algorithms. This improvement significantly reduces perception latency, which is the delay between detecting an object or event and the system's response. As a result, this helps improve the safety and effectiveness of ADAS functions.

Supported by middleware solutions, LeddarVision features simplified porting across Arm-based SoCs. By using Arm's pre-silicon port in the Armv9 architecture for early prototyping and validation, technical upgrades can be made to the software stack, providing industry-wide benefits.



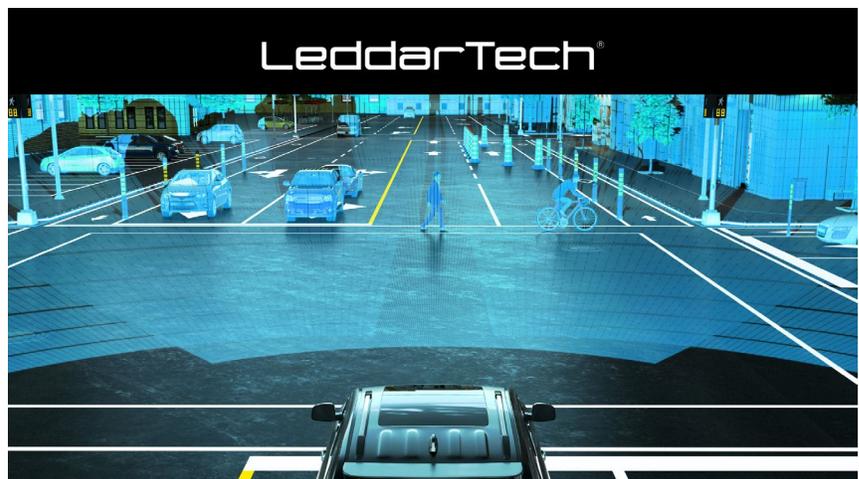
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By delivering a pre-optimized and pre-ported LeddarVision, the software is ready for integration and offers OEMs a head start on development efforts, speeding up automotive development cycles. Additionally, LeddarVision leverages Arm-based cloud computing infrastructure for early simulation and validation, providing further time-to-market benefits.

## The Benefits to Vehicle Manufacturers: Efficiency, Safety and Performance

LeddarVision offers OEMs several advantages when operating on next-generation ECUs. One of the primary benefits is the availability of pre-optimized ADAS software, which helps accelerate the integration and development process, allowing vehicle manufacturers to bring new features to market faster than ever before.

LeddarVision incorporates state-of-the-art technologies, such as AI-based perception and sensor fusion, providing OEMs with advanced solutions that enhance vehicle safety and performance. It also contributes to reduce CPU utilization by optimizing ADAS algorithms specifically for Arm CPUs, helping to ensure efficient resource use and reducing the need for more expensive systems-on-chip (SoCs).





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The processing efficiency of LeddarVision results in faster reaction times and lower end-to-end latency, improving the responsiveness of ADAS features and significantly enhancing overall vehicle safety.

The solution has undergone rigorous testing and validation through real-world system dimensioning to ensure reliable performance under actual driving conditions. Instead of relying on generalized DMIPS estimations, practical metrics and scenarios are used to ensure LeddarVision meets real-world demands and expectations. This detailed testing approach helps deliver consistent and dependable performance, aligning with the practical needs of everyday driving.

## Pioneering the Future of Automotive Safety

The joint effort between LeddarTech and Arm represents a significant advancement in ADAS technology development and deployment. LeddarVision offers substantial benefits to OEMs, including advanced next-generation ECUs, lower CPU utilization, reduced latency and validated real-world performance.

This collaboration is a testament to both companies' commitment to the future of automotive safety – where technology and innovation drive progress.

For more information on Arm-based automotive technologies visit:

- [LeddarTech](#)
- [LeddarVision](#)
- [Arm ADAS and Autonomous Driving](#)