Subaru Integratating AMD Adaptive Computing in its AI-Based EyeSight Safety Systems

CUSTOMER

SUBARU

INDUSTRY

Automotive

CHALLENGES

Subaru was looking to enhance the recognition-processing capabilities of its stereo cameras, driving toward a goal of "zero fatal road accidents in 2030."

SOLUTION

The company is integrating stereo camera and AI Inference in its next-generation EyeSight safety systems with the AMD Versal™ AI Edge Series Gen 2 adaptive SoC.

RESULTS

With AMD adaptive computing, Subaru has been able to enable faster image processing in its EyeSight system. It is now looking to improve inference efficiency with the AMD Versal™ AI Edge Series Gen 2 device.

AMD TECHNOLOGY AT A GLANCE

-AMD Versal AI Edge Series Gen 2 adaptive SoCs in Next-Generation EyeSight System.

- AMD Zynq™ UltraScale+™ XA MPSoC in current EyeSight System.

COMPANY TO INTEGRATE STEREO CAMERA AND AI INFERENCE IN NEXT-GENERATION EYESIGHT SAFETY SYSTEMS WITH AMD VERSAL™ AI EDGE SERIES GEN 2 ADAPTIVE SoC

AMD adaptive computing is powering Subaru's vision-based advanced driver-assistance system (ADAS), known as EyeSight. The system is integrated into select Subaru car models and provides advanced features including adaptive cruise control, lane-keep assist, and pre-collision braking, putting state-of-the-art safety technology into the hands of consumers.

The EyeSight system uses two cameras that are designed to act like human eyes to detect other cars, objects, and pedestrians ahead of the vehicle in three dimensions and to accurately determine the distance, shape, and velocity of each object.

CHALLENGE

Subaru previously used dedicated ASICs in its EyeSight system but wanted to improve its adaptability and enable firmware upgrades more easily. That's when it decided to go with the AMD Zynq™ UltraScale+™ (XA) multiprocessor system-on-chip (MPSoC).

After years of success, the company is looking to advance its cutting-edge AI inference performance and ultra-low latency processing at a low cost to enhance the recognition-processing capabilities of its stereo cameras, driving toward a goal of "zero fatal road accidents in 2030."

SOLUTION

Subaru is collaborating with AMD to deploy a new AMD Versal™ AI Edge Series Gen 2 adaptive SoC in its future, next-generation EyeSight system.

Featuring next-generation AI engines, delivering up to 3X the AI processing power of previous-generation AMD Versal products and higher memory bandwidth[1], this device delivers improved inference efficiency for perception processing, that will enhance the 3D Stereo Vision technology in Subaru's EyeSight system.

AMD adaptive SoCs provide the high-performance, ultra-low latency, and functional safety capabilities that are required to accurately depict and react to dynamic driving scenarios.

For example, a current EyeSight safety feature available in Subaru models in the 2024 lineup, can help drivers avoid accidents by providing automatic steering and braking support. Other safety features provided by the EyeSight system include lane departure warnings, lane keep assist, and pre-collision throttle management.

AMD adaptive computing technology integrates stereo camera recognition, including 3D point clouds and AI inference, with the ultra-low latency and functional safety that is needed.

"The ability to do curve prediction is also particularly important to Subaru," said Wayne Lyons, senior director of product marketing for the automotive business unit at AMD. "Using our adaptive technology, the company has been able to bring sensor fusion from the radar and forward cameras into the Eyesight system."

Eiji Shibata, Executive Officer and Chief Digital Car Officer at Subaru Corporation, said, "Because AMD automotive devices contain built-in capabilities that allow us to meet strict ASIL requirements, they are unquestionably the best technology to implement in our cutting-edge ADAS vision systems."

RESULT

Shibata said with the switch to AMD, Subaru was able to improve its EyeSight system by enabling faster processing.

Lyons added that "this Subaru design demonstrates the value that AMD AI technology can bring to help the world's top carmakers drive the cutting edge of automotive safety."

"As cars trend toward higher levels of automation, the need for scalar compute and ASIL - D functional safety will increase." Lyons said. "The new AMD Versal AI Edge Series Gen 2 provides the processing capability and flexibility that will enable Subaru to deliver elevated performance and safety features."

To learn more about Subaru Eyesight technology, please visit: https://www.subaru.com/eyesight.html.

ABOUT SUBARU

Subaru Corporation is a leading manufacturer in Japan, with automotive and aerospace businesses as the pillars of its operations. Guided by the vision of "Delivering Happiness to All," Subaru is dedicated to continuously enriching people's hearts, minds, and lives by providing "Enjoyment and Peace of Mind." This commitment goes beyond our products and services, encompassing all aspects of our business activities to enhance our core values. Subaru strives for sustainable growth of the Subaru Group and the creation of an enjoyable and sustainable society by fostering strong relationships with customers, retailers, communities, and all stakeholders. More information at: https://www.subaru.co.jp/en.

ABOUT AMD ZYNQ ULTRASCALE+ MPSoC

AMD Zynq™ UltraScale+™ MPSoC devices provide 64-bit processor scalability while combining real-time control with soft and hard engines for graphics, video, waveform, and packet processing. Built on a common real-time processor and programmable logic equipped platform, three distinct variants include dual application processor (CG) devices, quad application processor and GPU (EG) devices, and video codec (EV) devices, creating unlimited possibilities for applications such as 5G Wireless, Next-generation ADAS, and Industrial Internet-of-Things.

ABOUT AMD VERSAL AI EDGE SERIES GEN 2

AMD Versal™ AI Edge Series Gen 2 adaptive SoCs deliver end-to-end acceleration for AI-driven embedded systems - all in a single device built on a foundation of enhanced safety and security. Combining world-class programmable logic with a new high-performance processing system of integrated Arm ® CPUs and next-generation AI engines, these devices enable all three phases of compute in embedded AI applications: preprocessing, AI inference, and postprocessing.

ABOUT AMD

For more than 50 years, AMD has driven innovation in high-performance computing, graphics, and visualization technologies. Billions of people, leading Fortune 500 businesses, and cutting-edge scientific research institutions around the world rely on AMD technology daily to improve how they live, work, and play. AMD employees are focused on building leadership, high-performance, and adaptive products that push the boundaries of what is possible. For more information about how AMD is enabling today and inspiring tomorrow, visit the AMD (NASDAQ: AMD) website, blog, LinkedIn, and X pages.

[1] Based on the projected combined total DMIPs of the Versal AI Edge series Gen 2 and Versal Prime series Gen 2 processing systems when configured with 8 Arm Cortex-A78AE applications cores @2.2 GHz & 10 Arm Cortex-R52 Real-time cores @1.05 GHz, compared to the published combined total DMIPs of the processing systems in the first generation Versal AI Edge series and Versal Prime series. Versal AI Edge Series Gen 2 and Prime Series Gen 2 operating conditions: highest available speed grade, 0.88V PS operating voltage, split-mode operation, maximum supported operating frequency. First generation Versal AI Edge series and Prime series operating conditions: highest available speed grade, 0.88V PS operating voltage, maximum supported operating frequency. Actual DMIPs performance will vary when final products are released in market. (VER-027)