Ambarella Launches AI Domain Controller SoC Family for Single-Chip Multi-Sensor Perception, Fusion and Path Planning in ADAS to L4 Autonomous Vehicles

January 4, 2022

CV3 Automotive SoC Family Offers Unprecedented 500 eTOPS AI Performance Combined With High-Resolution Image, Radar and Ultrasonic Processing at Extremely Low Power

SANTA CLARA, Calif., Jan. 04, 2022 (GLOBE NEWSWIRE) -- Ambarella, Inc. (NASDAQ: AMBA), an AI vision silicon company, today announced during CES the CV3 AI domain controller family. This fully scalable, power-efficient CVflow® family of SoCs provides the automotive industry's highest AI processing performance, at up to 500 eTOPS, representing a 42x increase over Ambarella's prior automotive family. Featuring up to 16 Arm® Cortex-A78AE CPU cores, the CV3 provides up to a 30x boost in CPU performance over the prior generation in support of autonomous vehicle (AV) software applications. This family enables centralized, single-chip processing for multi-sensor perception—including high-resolution vision, radar, ultrasonic and lidar—as well as deep fusion for multiple sensor modalities and AV path planning. The result is robust ADAS and L2+ to Level 4 autonomous driving (AD) systems with greater levels of environmental perception in challenging lighting, weather and driving conditions for both driver viewing and machine perception.

Watch a short video about the CV3, here: https://youtu.be/SdAyRalOdp0

"With our new CV3 AI domain controller family, we are now capable of running the full ADAS and AD stack with a single chip, while providing unprecedented performance and power efficiency," said Fermi Wang, President and CEO of Ambarella. "Through enhancements to our on-chip ISP, along with simultaneous radar processing that can take advantage of our Oculii adaptive AI algorithms, Ambarella is helping the automotive industry unlock greater levels of perception accuracy across all environmental conditions to realize the promise of autonomous driving."

The CV3 marks the debut of Ambarella's next-generation CVflow architecture, which continues the company's algorithm-first design philosophy. This drove the development of the on-chip neural vector processor (NVP), with up to 500 eTOPS of AI compute, industry-leading power efficiency and support for the latest advancements in neural network (NN) inferences. The NVP is also enhanced to run advanced radar perception software, such as the Oculii adaptive AI software algorithms. This is complemented by a new floating-point general vector processor (GVP) designed to offload classical computer vision and radar processing from the NVP engines, and floating-point-intensive algorithms from the Arm CPUs.

The CV3 family's unique hardware scalability allows automakers to unify their software stacks across their entire retail portfolios, while reducing the cost and complexity of software development. This scalability directly addresses the rising complexity of automotive software by providing an alternative to the fragmented ADAS SoC offerings from competitors. Additionally, the CV3 family accelerates automakers' development timelines while simplifying the deployment of new features by providing the headroom for a single, robust over-the-air (OTA) update implementation.

This new family has multiple options to meet the product strategies of OEMs and Tier 1s, alike, from its low-power SoCs for regulatory-class, forward-facing cameras, scaling all the way to premium SoCs for Level 4 fully automated driving. This new family also supports both central and zonal architectures. In addition to covering the whole AD stack, the CV3 can simultaneously process in-cabin sensing applications, including driver and occupant monitoring. Ambarella's complete line of AI perception SoCs is uniquely positioned to support the full range of viewing, recording, sensing and path planning applications, from basic ADAS to L4 AVs. This means that automakers no longer need to develop different software stacks for their entry-level, mid-range and premium vehicles, as they can use Ambarella's unified CVflow platform across all models, saving engineering costs while enabling faster responses to market trends.

Leveraging a comprehensive set of mature software tools and a robust SDK, Ambarella's flexible CVflow AI platform provides customers with an unprecedented opportunity to innovate and differentiate their products in the marketplace. To further expand this capability, Ambarella has cultivated a broad ecosystem of software partners for the CVflow platform, working closely with them to port and optimize their applications.

The CV3 also integrates Ambarella's next-generation ISP, extending the company's lead in image signal processing quality. By simultaneously supporting up to 12 physical or 20 virtual cameras, a single CV3 can process the entire sensor suite, which for typical L2+ deployments includes 10 cameras, five radar modules and numerous ultrasonic sensors. Additionally, higher-performance stereo and dense optical flow engines provide greater depth and motion perception.

Additional features of the new CV3 central domain controller family include:

- Automotive GPU for applications such as 3D surround-view rendering
- Hardware security module, enabling the isolation of different domains and secure software provisioning
- PCIe high-speed interfaces for ultra-low-latency communications
- Processing headroom for OTA software updates and testing software stacks in shadow mode

Availability

The first SoCs in the CV3 family are expected to be available for sampling during the first half of 2022. For more information, contact Ambarella: https://www.ambarella.com/contact-us/.

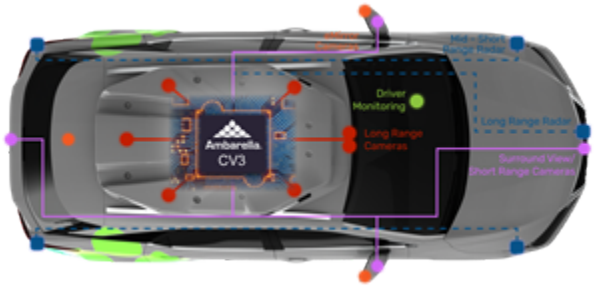
About Ambarella
Ambarella's products are used in a wide variety of human and computer vision applications, including video security, advanced driver assistance systems (ADAS), electronic mirror, drive recorder, driver/cabin monitoring, autonomous driving and robotics applications. Ambarella's low-power systems on chip (SoCs) offer high-resolution video compression, advanced image processing and powerful deep neural network processing to enable intelligent cameras to extract valuable data from high-resolution video streams. For more information, please visit www.ambarella.com

Contacts

- Media Contact: Eric Lawson, elawson@ambarella.com, (480) 276-9572
- Investor Contact: Louis Gerhardy, lgerhardy@ambarella.com, (408) 636-2310
- Sales Contact: www.ambarella.com/about/contact/inquiries

A photo accompanying this announcement is available at https://www.globenewswire.com/NewsRoom/AttachmentNg/9fa021d7-1a39-4c07-b415-0f7301fabc0d

Ambarella's New CV3 SoCs – Single-Chip Processing for L2+ to L4 AVs



The Ambarella CV3 AI domain controller family enables centralized, single-chip processing for multi-sensor perception—including high-resolution vision, radar, ultrasonic and lidar—as well as deep fusion for multiple sensor modalities and AV path planning.