Synopsys DesignWare ARC Data Fusion IP Subsystem Incorporated by Himax in Their Artificial Intelligence WiseEye ASIC

Always-On Sensing ASIC Enables Machine Learning for Ultra-Low Power Applications

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Highlights:

- Himax WiseEye ASIC platform is optimized for application developers deploying machine learning on battery-powered AIoT devices
- Synopsys DesignWare ARC Data Fusion IP Subsystem with audio software library, tightly coupled pulse density modulation (PDM), and I^2S peripherals, simplifies the integration of voice and audio interfaces increasingly common in IoT devices

Synopsys, Inc. (Nasdaq: SNPS) today announced that Himax's newly launched artificial intelligence (AI)-enabled WiseEye WE-I Plus ASIC platform has integrated Synopsys' DesignWare® ARC® Data Fusion IP Subsystem. The WE-I Plus ASIC is designed for application developers deploying CNN-based machine learning (ML) models on artificial intelligence (AI) and IoT applications, including smart home appliances and surveillance systems.

"The demand for battery-powered smart devices with AI-enabled intelligent sensing is rapidly growing, especially in markets such as home appliances, door lock, TV, notebook, and building control or security," said David Lyou, executive vice president of Himax Technologies. "Our WiseEye WE-I Plus ASIC Platform, leveraging Synopsys' ARC EM9D processor IP, can be used with popular ML frameworks for the development of a wide range of applications in audio, video, and signal processing where power is a strict constraint and on-device memory is limited. We are receiving positive feedback on our solution from our partners and leading industry players."

The WiseEye WE-I Plus ASIC incorporates Synopsys' low-power ARC EM9D-based IP subsystem with enhanced DSP features and power-efficient hardware acceleration for CDM, HOG, and JPEG algorithms used for real-time motion detection, object detection, and image processing. Since data security is an important consideration in AIoT applications, the WiseEye WE-I Plus ASIC is equipped with comprehensive security hardware and software such as security boot, security Over-The-Air (OTA), and secure metadata output over Transport Layer Security (TLS). To prolong battery life, WiseEye was developed using a low-power-driven ASIC design flow and implements low dropout (LDO) regulators and multi-state power management unit (PMU) to support shutdown, always-on sensing (AoS), and computer vision efficient operation modes. An associated software development kit (SDK), which includes the open-source embARC MLI library of essential kernels for effective inference of small or mid-sized machine learning models, is provided for efficient software development.

Synopsys' DesignWare ARC Data Fusion IP Subsystem offers a suite of tightly coupled interface peripherals, including pulse density modulation (PDM) and I^2S, as well as an audio processing software library to speed application software development. The integrated ARC EM9D processor combines RISC and DSP processing with multi-banked data memory support to boost digital signal processing performance while minimizing power consumption.

"Synopsys' ARC EM-based subsystems are ideally suited for the increasing number of ultra-low power AI

and IoT devices that draw information from multiple sensors and require greater processing bandwidth within tight power budgets," said John Koeter, vice president of marketing for IP at Synopsys. "The combination of the ARC Data Fusion Subsystem and the embARC MLI software library, which provides the fundamental kernels needed to quickly implement machine learning algorithms, enables innovative companies like Himax to provide differentiated solutions to their customers."

Availability and Resources

Himax will showcase the WiseEye WE-I Plus ASIC platform at the upcoming Synopsys ARC Summit, China on November 13 at the Shangri La Hotel in Beijing.

- Himax's WiseEye WE-I Plus ASIC Platform, which includes the WE-I Plus ASIC, is available now from Himax
- Synopsys' DesignWare ARC Data Fusion Subsystem is available now from Synopsys
- Synopsys' embARC Machine Learning Inference software library is available now from www.embarc.org

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Editorial Contact:
Norma Sengstock
Synopsys, Inc.
650-584-4084
norma@synopsys.com

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