Synopsys and Sensory, Inc. Deliver Ultra-Low Power Voice Control Solution for Mobile, Automotive and Consumer Applications

Sensory TrulyHandsfree Voice Control Software Optimized for Synopsys' DesignWare ARC EM5D Processor Consumes as Little as 0.9 Microwatts in Detection Mode and 40 Microwatts in Recognition Mode

Disclaimer: GlobalFoundries acquired the Synopsys Processor Solutions business on June 1, 2026. Clickhere to learn more.

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Highlights:

- Sensory's TrulyHandsfree speech recognition and voice control software consumes as little as 0.9 microwatts of dynamic power executing on Synopsys' ultra-low power ARC EM5D processor in typical 28-nanometer (nm) processes
- TrulyHandsfree offers enhanced performance and personalization capability through fixed triggers with user enrollment as well as user-defined triggers
- Pre-validated and optimized hardware-software solution reduces development time and risk for designs requiring energy-efficient processing of voice/speech, audio and sensor data

Synopsys, Inc. (Nasdaq: SNPS) and Sensory, Inc. today announced availability of an optimized port ofSensory's TrulyHandsfree™ voice control software for the Synopsys DesignWare®ARC® EM DSP Processor Family. In typical 28-nm process technologies, the ARC EM5D processor consumes less than one microwatt of power executing TrulyHandsfree low-power sound detection software, and less than 40 microwatts operating in speech recognition mode. The combination of Sensory's highly optimized voice control technology running on power-efficient and DSP-enhanced ARC EM processor cores enables designers to rapidly integrate a complete, ultra-low energy hardware-software solution for voice/speech processing into their "always-on" devices.

"The trend towards greater numbers of voice-enabled IoT devices is driving the need for integrated hardware and software solutions that can deliver excellent performance while keeping power consumption at a minimum to extend battery life," said Bernard Brafman, vice president of business development at Sensory, Inc. "By optimizing Sensory's ultra-low power TrulyHandsfree technology for the highly efficient DesignWare ARC EM5D processor, we are providing designers with the ability to implement highly accurate voice activation capabilities within the stringent power and performance parameters of their designs."

Sensory's TrulyHandsfree voice control technology is extremely robust to noise and designed to prevent false triggers during normal room noise and conversations. The solution offers multiple phrase technology that recognizes, analyzes and responds to dozens of keywords. It consistently recognizes phrases even when embedded in sentences and surrounded by noise, operating reliably in close to 0 dB signal-to-noise ratio real-world environments. Traditional approaches to keyword spotting have failed in high noise and frequently false-fire, but TrulyHandsfree can deliver more than 95 percent accuracy without false fires even in high noise and speech. Ultra-low power consumption in detection and recognition modes extends battery life for always-on Internet-of-Things (IoT) and wearable devices. Both fixed triggers with user enrollment and user-defined triggers provide better performance and allow for personalization.

The DesignWare ARC EM DSP Family of processors, which includes the EM5D and EM7D processors, implements a scalable pipeline that offers an optimal balance of performance, power consumption and size for a range of control and DSP applications. The processors include a unified, single-cycle 32 x 32 MUL/MAC unit with 32-bit/64-bit accumulators. To deliver enhanced performance for filtering, fast Fourier transform (FFT) and other signal processing algorithms, the EM5D and EM7D feature fractional support, rounding and non-rounding instructions, as well as divide, square root and fixed-point math functions. Vector and SIMD support provides greater processor efficiency by enabling multiple data values to be processed in a single operation, providing the DSP performance required for ultra-low power, always-on devices that process audio, voice and sensor data. These processors deliver excellent performance efficiency of up to 1.77 DMIPS/MHz while consuming as little as 3.5 microwatts/MHz dynamic power in a typical 28-nm HPM process technology. Like all ARC processors, the EM5D and EM7D are highly configurable so that each instance can be tailored to achieve the optimum balance of DSP and RISC performance for the target application as well as power and area efficiency. ARC Processor EXtensions (APEX) technology offers designers the ability to create user-defined instructions, enabling the integration of custom hardware accelerators that improve application-specific performance while reducing power consumption and the amount of memory required.

"Consumer and IoT devices with voice activation capabilities are becoming ubiquitous and demand more sophisticated solutions that can deliver the required performance with very low power," said John Koeter, vice president of marketing for IP

and prototyping at Synopsys. "With the optimized port of Sensory's TrulyHandsfree voice control software for the ultra-low power ARC EM processors, we're helping designers integrate the broad range of voice detection and control features they need without compromising the battery life of their always-on applications."

Availability and Resources

The ARC EM5D and EM7D processors are available now from Synopsys, and the optimized port of theTrulyHandsfree voice control software is available now from Sensory.

About Sensory

Sensory Inc. creates a safer and superior UX through vision and voice technologies. Sensory's technology is widely deployed in consumer electronics applications including mobile phones, automotive, wearables, toys, IoT and various home electronics. With its TrulyHandsfree™ voice control, Sensory has set the standard for mobile handset platforms' ultra-low power "always listening" touchless control. Sensory's TrulySecure is changing the authentication landscape with highly accurate voice and facial biometric fusion. To date, Sensory's technologies have shipped in over half a billion units of leading consumer products. Visit Sensory at www.sensory.com.

About Synopsys

Synopsys, Inc. (Nasdaq:SNPS) is the Silicon to Software™ partner for innovative companies developing the electronic products and software applications we rely on every day. As the world's 15th largest software company, Synopsys has a long history of being a global leader in electronic design automation (EDA) and semiconductor IP, and is also a leader in software quality and security testing with its Coverity® solutions. Whether you're a system-on-chip (SoC) designer creating advanced semiconductors, or a software developer writing applications that require the highest quality and security, Synopsys has the solutions needed to deliver innovative, high-quality, secure products. Learn more at http://www.synopsys.com.

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