GSI Technology Introduces Python-Based Copperhead Compiler Suite to Unleash the Full Power of Gemini APU for Flexible AI and High-Performance Computing

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SUNNYVALE, Calif., Aug. 10, 2023 (GLOBE NEWSWIRE) -- GSI Technology, Inc. (Nasdaq: GSIT), developer of the Gemini® Associative Processing Unit (APU) for AI and high-performance parallel computing (HPPC) and a leading provider of high-performance memory solutions for the networking, telecommunications, and military markets, today announced the beta launch of its Copperhead compiler stack. This technology is specifically designed to complement the Gemini APU, an innovative compute-in-memory device engineered to excel in high-performance, low-power applications such as search, generative AI retrieval, HPPC, and more.

The Copperhead compiler suite, a Python-based tool, unlocks the full potential of the Gemini APU's impressive capabilities, including its associative, massively parallel, non-Von-Neumann bit-processing. This tool empowers developers to create custom frameworks at bit-level granularity, facilitating the simulation and execution of new algorithms that will run at remarkable speeds on currently available production APU hardware.

“GSI Technology, Inc. is proud to unveil the Copperhead Compiler Suite for the Gemini APU, revolutionizing computing power and bringing unprecedented advancements to the AI and HPPC industry,” said Lee-Lean Shu, CEO and Chairman of GSI Technology. “Built upon LPython, Copperhead's pioneering flexible framework innovation combines Python's user-friendliness with APU performance at least as fast as writing in C language. This empowers developers to create algorithms tailored for a diverse spectrum of applications.”

Copperhead seamlessly integrates LPython, a user-friendly open-source compiler, combining the ease and familiarity of Python programming with code performance comparable to C. Developers can create optimum data frameworks to harness Gemini APU's unique capabilities for their algorithms. The Copperhead suite also works seamlessly with already available Gemini APU libraries, enabling rapid application development. GSI will be open sourcing the emulation tools of Copperhead to enable community development of applications and libraries for the AI and HPPC markets.

Empowering Developers with Programmable Frameworks: Gemini APU's bit-programmable microcode sets it apart. Copperhead offers algorithm architects pure-Python emulators and specialized DSLs, boosting innovation by allowing easy experimentation with various data types.

Accelerated Performance: Copperhead empowers programmers to prototype and debug APU application code exclusively in Python. With optimized compilation and testing, applications achieve impressive speeds on the device, often surpassing emulator speeds by over 1,000 times. For example, Conway’s Game of Life running at about 300FPS in emulation, runs at 13 million FPS on the APU.

Leveraging Open Source Power: Open source plays a pivotal role, enhancing both execution speed and development and LPython's evolution benefits from contributions by open-source developers. This approach fosters ongoing optimization and development improvements.

Together, the Gemini APU and Copperhead Compiler Suite give developers resources to create groundbreaking solutions, representing a significant leap forward in utilizing the computing power of the Gemini APU and enabling diverse applications to thrive.

To learn more about GSI’s Gemini APU , visit https://www.gsitechnology.com/compute

To learn more about LPython, visit https://github.com/lcompilers/lpython

To get access to the Copperhead compiler suite, please email apucompiler@gsitechnology.com

ABOUT GSI TECHNOLOGY

Founded in 1995, GSI Technology, Inc. is a leading provider of semiconductor memory solutions. The Company recently launched radiation-hardened memory products for extreme environments in space and the Gemini® Associative Processing Unit (APU), a memory-centric design that delivers significant performance advantages for diverse AI applications. The Gemini APU architecture removes the I/O bottleneck between the processors and memory arrays by performing massive parallel searches directly in the memory array where data is stored. The novel architecture delivers performance-over-power ratio improvements compared to CPU, GPU, and DRAM for applications like image detection, speech recognition, e-commerce recommendation systems, and more. Gemini is an ideal solution for edge applications with a scalable format, small footprint, and low power consumption where rapid, accurate responses are critical. For more information, please visit www.gsitechnology.com.

Forward-Looking Statements

The statements contained in this press release that are not purely historical are forward-looking statements within the meaning of Section 21E of the Securities Exchange Act of 1934, as amended, including statements regarding GSI Technology's expectations, beliefs, intentions, or strategies regarding the future. All forward-looking statements included in this press release are based upon information available to GSI Technology as of the date hereof, and GSI Technology assumes no obligation to update any such forward-looking statements. Forward-looking statements involve a variety of risks and uncertainties, including the effectiveness of newly developed software programs and tools and customer adoption of such programs and tools and related hardware products, any of, which could cause actual results to differ materially from those projected. Further information regarding these and other risks relating to GSI Technology's business is contained in the Company's filings with the Securities and Exchange Commission, including those factors discussed under the caption "Risk Factors" in such filings.

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