2013 Symposia on VLSI Circuits Workshop

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14:40-15:40 3-D Integration of Memories and Logic

J. Thomas Pawlowski , Micron

Abstract

Memory continues to increase in system importance, becoming an ever-increasing percentage of system silicon, of system power, and of system performance impact. This increase in importance is accompanied by difficult scaling challenges resulting in the need to disrupt the normal evolutionary development path and seek more clever solutions. This talk demonstrates the need for memory abstraction and illustrates it using the Hybrid Memory Cube (HMC) concepts. The HMC approach is contrasted with other current efforts geared at solving the high bandwidth problems. The latest HMC performance simulation results are discussed. The new capabilities and high system performance results reveal other system shortcomings that need to be addressed. Some proposals are made to address these future shortcomings.

Biography

J. Thomas Pawlowski is a Micron Fellow and Chief Technologist in the DRAM Solution Group's Architecture Development Group. He is responsible for the technical aspects of innovative products, technologies, memory and systems architectures. He has created numerous ground-breaking memory architectures and concepts including Double Data Rate, Quad Data Rate, Double Address Rate, high-speed SRAM architectures, RLDRAM low-latency high-request rate memory, PSRAM, posted write concepts, low-power DRAM concepts, multi-channel and abstracted memory concepts, High-Speed NAND concepts, hierarchical cache and cache control concepts, Phase Change memory concepts, logic and memory integration in 2D, 2.5D and 3D, memory control concepts, and others to be disclosed in the future. Outside of the memory field, he has broad system, hardware and software design experience. Thomas is also an entrepreneur, having started a successful loudspeaker company and is currently designing a revolutionary 2-seat electric commuter 300+ MPGe car in his copious free time. He received a Bachelor of Applied Science in Electrical Engineering from Waterloo in 1984 and has over 150 issued US and international patents.