

# High-Bandwidth, High-Capacity, Low-Power Memory Systems

Bruce Jacob

University of Maryland, United States

**Abstract.** In large systems, scale is determined by the memory needed: users of supercomputers choose the number of nodes based on the amount of DRAM they will receive; administrators in data centers and enterprise computing run the largest workload possible before paging makes performance unacceptable. These systems are not compute-bound; they are memory-bound. This talk will discuss several of the recent solutions that our group has helped to develop, including flash-based main memory systems and Micron's Hybrid Memory Cube DRAM.

## Biography

Bruce Jacob is a Keystone Professor of Electrical and Computer Engineering and former Director of Computer Engineering at the University of Maryland in College Park. He received the AB degree in mathematics from Harvard University in 1988 and the MS and PhD degrees in CSE from the University of Michigan in Ann Arbor in 1995 and 1997, respectively. He holds several patents in the design of circuits for electric guitars and started a design company around them. He also worked for two successful startup companies in the Boston area: Boston Technology and Priority Call Management. At Priority Call Management he was the initial system architect and chief engineer. He is a recipient of a US National Science Foundation CAREER award for his work on DRAM, and he is the lead author of an absurdly large book on the topic of memory systems. His research interests include memory systems, operating systems, distributed systems, and designing electric guitars.