Simulation is Passé ; all Future Systems Require FPGA Prototyping

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Abstract

Power and energy dominate the design of all systems today from smart phones to Internet-of-Things to gigantic data centers. The single most promising approach to reducing power is replacing compute intensive software by special purpose hardware. Without hardware specialization, a smart phone wouldn't have so many different radios or high-resolution cameras or high quality audio or video or GPS navigation. Whether this capability is delivered via ASICs or reconfigurable logic, the designers of such systems have to be proficient in both hardware and software to understand the trade-offs. Large FPGAs with modern high-level hardware synthesis tools offer a design flow that is essential to mitigate development risks without increasing the time-to-market. We will illustrate the power of this design flow via numerous working prototypes developed by us.

Biography

Arvind is the Johnson Professor of Computer Science and Engineering at MIT. Arvind's group, in collaboration with Motorola, built the Monsoon dataflow machines and its associated software in the late eighties. In 2000, Arvind started Sandburst which was sold to Broadcom in 2006. In 2003, Arvind co-founded Bluespec Inc., an EDA company to produce a set of tools for high-level synthesis. In 2001, Dr. R. S. Nikhil and Arvind published the book "Implicit parallel programming in pH". Arvind's current research focus is on enabling rapid development of embedded systems. Arvind is a Fellow of IEEE and ACM, and a member of the National Academy of Engineering and the American Academy of Arts and Sciences.