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Special Issue Reprint

Emerging Applications of FPGAs and Reconfigurable Computing System

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Field-programmable gate arrays and reconfigurable computing have moved beyond their previous role as convenient prototyping platforms. In modern computing systems, they are increasingly occupying a strategic position between the flexibility of software and the efficiency of fixed-function hardware. This reprint, titled “Emerging Applications of FPGAs and Reconfigurable Computing System”, reflects both the breadth of application domains and the diversity of abstraction levels at which innovation is taking place. Taken together, they show that progress in reconfigurable computing depends not only on faster devices, but also on advances in design flows, arithmetic structures, control architectures, resilient data processing, and hardware-aware machine learning. The contributions range from methodological and architectural studies to concrete deployments in power electronics, high-energy physics, spaceborne systems, wireless testbeds, and edge inference. Overall, they illustrate the continuing expansion of reconfigurable solutions into technically demanding and scientifically relevant contexts.

