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FPGA-based Digital Convolution for Wireless Applications (Hardback)

By Lei Guan

Springer International Publishing AG, Switzerland, 2017. Hardback. Condition: New. 1st ed. 2017. Language: English . Brand New Book. This book presents essential perspectives on digital convolutions in wireless communications systems and illustrates their corresponding efficient real-time field-programmable gate array (FPGA) implementations. FPGAs or generic all programmable devices will soon become widespread, serving as the brains of all types of real-time smart signal processing systems, like smart networks, smart homes and smart cities. The book examines digital convolution by bringing together the following main elements: the fundamental theory behind the mathematical formulae together with corresponding physical phenomena; virtualized algorithm simulation together with benchmark real-time FPGA implementations; and detailed, state-of-the-art case studies on wireless applications, including popular linear convolution in digital front ends (DFEs); nonlinear convolution in digital pre-distortion (DPD) enabled high-efficiency wireless RF transceivers; and fast linear convolution in massive multiple-input multiple-output (MIMO) systems. After reading this book, students and professionals will be able to: * Understand digital convolution with inside-out information: discover what convolution is, why it is important and how it works. * Enhance their FPGA design skills, i.e., enhance their FPGA-related prototyping capability with model-based hands-on examples. * Rapidly expand their digital signal processing (DSP) blocks: to examine...



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