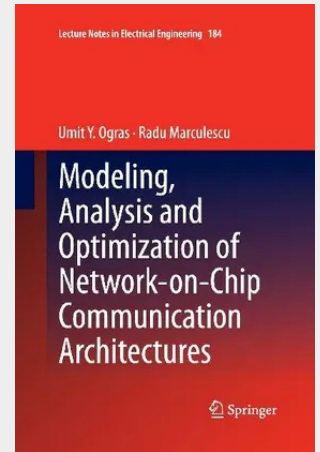


Modeling, Analysis and Optimization of Network-on-Chip Communication Architectures

Traditionally, design space exploration for Systems-on-Chip (SoCs) has focused on the computational aspects of the problem at hand. However, as the number of components on a single chip and their performance continue to increase, the communication architecture plays a major role in the area, performance and energy consumption of the overall system. As a result, a shift from computation-based to communication-based design becomes mandatory. Towards this end, network-on-chip (NoC) communication architectures have emerged recently as a promising alternative to classical bus and point-to-point communication architectures.

In this dissertation, we study outstanding research problems related to modeling, analysis and optimization of NoC communication architectures. More precisely, we present novel design methodologies, software tools and FPGA prototypes to aid the design of application-specific NoCs.

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106,99 €

99,99 € (zzgl. MwSt.)

Lieferfrist: bis zu 10 Tage

Artikelnummer: 9789400798656

Medium: Buch

ISBN: 978-94-007-9865-6

Verlag: Springer

Erscheinungstermin: 03.04.2015

Sprache(n): Englisch

Auflage: 2013

Serie: Lecture Notes in Electrical Engineering

Produktform: Kartoniert

Gewicht: 2934 g

Seiten: 174

Format (B x H): 155 x 235 mm

