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Titolo	Hardware/Software Co-Design and Optimization for Cyberphysical Integration in Digital Microfluidic Biochips / / by Yan Luo, Krishnendu Chakrabarty, Tsung-Yi Ho
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ISBN	3-319-09006-2
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Descrizione fisica	1 online resource (208 p.)
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Soggetti	Electronic circuits Biomedical engineering Circuits and Systems Electronic Circuits and Devices Biomedical Engineering and Bioengineering
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
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Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references at the end of each chapters.
Nota di contenuto	Introduction -- Error-Recovery in Cyberphysical Biochips -- Real-Time Error Recovery Using a Compact Dictionary -- Biochemistry Synthesis under Completion-Time Uncertainties in Fluidic Operations -- Optimization of On-Chip Polymerase Chain Reaction -- Pin-Count Minimization for Application-Independent Chips -- Pro-Limited Cyberphysical Microfluidic Biochip -- Conclusions.
Sommario/riassunto	This book describes a comprehensive framework for hardware/software co-design, optimization, and use of robust, low-cost, and cyberphysical digital microfluidic systems. Readers with a background in electronic design automation will find this book to be a valuable reference for leveraging conventional VLSI CAD techniques for emerging technologies, e.g., biochips or bioMEMS. Readers from the circuit/system design community will benefit from methods presented to extend design and testing techniques from microelectronics to mixed-technology microsystems. For readers from the microfluidics domain, this book presents a new design and development strategy for

cyberphysical microfluidics-based biochips suitable for large-scale bioassay applications. • Takes a transformative, “cyberphysical” approach towards achieving closed-loop and sensor feedback-driven biochip operation under program control; • Presents a “physically-aware” system reconfiguration technique that uses sensor data at intermediate checkpoints to dynamically reconfigure biochips; • Enables readers to simplify the structure of biochips, while facilitating the “general-purpose” use of digital microfluidic biochips for a wider range of applications.