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Titolo	Fault-Tolerant Digital Microfluidic Biochips : Compilation and Synthesis // by Paul Pop, Mirela Alistar, Elena Stuart, Jan Madsen
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2016
ISBN	3-319-23072-7
Edizione	[1st ed. 2016.]
Descrizione fisica	1 online resource (238 p.)
Disciplina	620
Soggetti	Electronic circuits Biomedical engineering Circuits and Systems Biomedical Engineering and Bioengineering Electronic Circuits and Devices
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
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 -- Biochips: technologies and trends -- Digital microfluidic biochips -- Biochip architecture models -- Biochemical application programming and applications models -- Design methodology: the compilation and synthesis problems -- State-of-the-art research on compilation and synthesis -- Module-based compilation with reconfigurable operation execution -- Routing-based compilation -- Compilation for error recovery -- Synthesis of fault-tolerant architectures -- Synthesis of application-specific architectures -- Benchmarks and evaluation -- Conclusions and future work directions.
Sommario/riassunto	This book describes for researchers in the fields of compiler technology, design and test, and electronic design automation the new area of digital microfluidic biochips (DMBs), and thus offers a new application area for their methods. The authors present a routing-based model of operation execution, along with several associated compilation approaches, which progressively relax the assumption that operations execute inside fixed rectangular modules. Since operations can experience transient faults during the execution of a bioassay, the

authors show how to use both offline (design time) and online (runtime) recovery strategies. The book also presents methods for the synthesis of fault-tolerant application-specific DMB architectures.

- Presents the current models used for the research on compilation and synthesis techniques of DMBs in a tutorial fashion;
  - Includes a set of “benchmarks”, which are presented in great detail and includes the source code of most of the techniques presented, including solutions to the basic compilation and synthesis problems;
  - Discusses several new research problems in detail, using numerous examples. .
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