IEEE Design & Test

Call for Papers

IEEE Design & Test Special Issue on

Microfluidics: Design and Test Solutions for Enabling Biochemistry on a Chip

Publication date: November/December 2015

Guest Editors:

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Advances in microfluidics-based biochips, also known as lab-on-a-chip or bio-MEMS, have led to the emergence of new devices for automating laboratory procedures in biochemistry and molecular biology. These devices enable the precise control of nanoliter-scale biochemical samples and reagents and automate highly repetitive laboratory tasks by replacing cumbersome equipment with miniaturized and integrated systems. As these chips provide ultra-sensitive detection at significantly lower costs per assay than traditional methods, they find wide applications in clinical and diagnostic pathology, point-of-care healthcare services, and in drug design, among others.

As the use of microfluidics-based biochips increases, their complexity is expected to become significant due to the need for multiple and concurrent assays on the chip, as well as more sophisticated control mechanisms for resource management. Time-to-market and fault tolerance are also expected to emerge as design considerations. As a result, current full-custom design techniques will not scale well for larger designs. There is a need to deliver the same level of computer-aided design (CAD) support to the biochip designer that the semiconductor industry now takes for granted.

IEEE Design and Test of Computers seeks original manuscripts for a special issue on "Microfluidics: Design and Test Solutions for Enabling Biochemistry on a Chip" scheduled for publication in November/December 2015. The general objective of this special issue is to create a focused forum on the emerging design and test solutions on microfluidics-based biochips and its applications. The topics of interest include, but are not limited to:

- Architectural synthesis
- Cooling for integrated circuits
- Cross-contamination removal
- Cyberphysical integration
- Device modeling
- Drug-delivery biochips
- Fault modeling, testing, and protocol verification
- Light-actuated biochips
- Numerical simulation
- On-chip sensor
- Particle microfluidics
- Physical design
- Pin-constrained design
- Sample preparation

Submission and review procedures

Prospective authors should follow the submission guidelines for IEEE Design & Test. All manuscripts must be submitted electronically to the IEEE Manuscript Central Web site at http://www.manuscriptcentral.com/. Indicate that you are submitting your article to the special issue on "Microfluidics: Design and Test Solutions for Enabling Biochemistry on a Chip". All papers will undergo the standard IEEE Design & Test review process.

Schedule

- Submission deadline: January 15, 2015
- Notification of final acceptance: July 15, 2015
- Submission of final version: August 15, 2015
- Publication date: November/December 2015

Questions

Please direct questions regarding the special issue to guest editors Tsung-Yi Ho (tyho@cs.nctu.edu.tw) or Bhargab B. Bhattacharya (bhargab.bhatta@gmail.com).