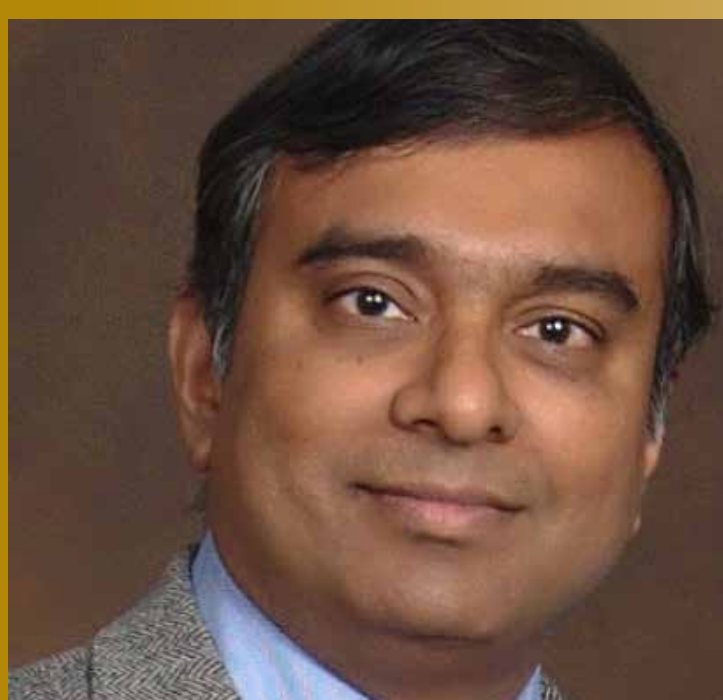


Distinguished Lectures Fall 2019



Colorado State University's Information Science and Technology Center (ISTeC) presents two lectures by

Dr. Krishnendu Chakrabarty

John Cocke Distinguished Professor and Chair
Department of Electrical and Computer Engineering
Duke University

ISTeC Distinguished Lecture

In conjunction with the Department of Computer Science and Department of Electrical and Computer Engineering Seminar Series

“Quo Vadis Digital Microfluidic Biochips? From Laboratory Research to Commercialization and Beyond”

Monday, Sept. 23, 2019
Reception with refreshments: 10:30 a.m.
Lecture: 11:00 a.m.-12:00 noon
Morgan Library Event Hall

Department of Computer Science and Department of Electrical and Computer Engineering Seminar Series Sponsored by ISTeC

“The Hype, Myths, and Realities of Testing 2.5D/3D Integrated Circuits”

Monday, Sept. 23, 2019
Lecture 3:00-4:00 p.m.
LSC Room 308

Abstracts

Quo Vadis Digital Microfluidic Biochips? From Laboratory Research to Commercialization and Beyond

Digital microfluidics was transitioned to the marketplace for sample preparation by Illumina a few years ago. Since then, this technology has also been deployed by Genmark for infectious disease testing and Baebies for the detection of lysosomal enzymes in newborns. This lecture will describe the journey from early laboratory research, PhD theses and publication of research articles, to technology transfer and licensing to companies. Today's microfluidic biochips are fully automated under program control and they can be dynamically reconfigured using sensor data. However, despite these success stories, there still remains a gap between microfluidics research and its adoption in microbiology. The presenter will describe how this gap can potentially be closed with new directions in digital microfluidics, including recent advances in using micro-electrode-dot arrays and acoustofluidics.

The Hype, Myths, and Realities of Testing 2.5D/3D Integrated Circuits

Despite the numerous benefits offered by 2.5D/3D integration, testing remains a major obstacle that hinders its widespread adoption. Concerns related to test cost, yield and reliability continue to derail the commercial exploitation of 2.5D/3D ICs. Test techniques and design-for-testability (DfT) solutions are now being explored in the research community, with considerable focus on wafer probing, pre-bond test of passive interposers, test access to modules in stacked dies, cost modeling, and the targeting of new defect types. In this talk, the speaker will examine the hype, myths, and realities of 2.5D/3D ICs. He will reflect on some of the over-hyped claims and describe some of the myths that have been exposed in recent years. He will present a reality-check on testing and DfT challenges, and describe some of the recent solutions being advocated for these challenges. The key questions to be addressed are: “What to Test? How to Test? When to Test?” To answer these questions, the presentation will cover pre-bond testing of TSVs and interposers, DfT solutions and optimization for stack testing, and test-flow selection. New DfT solutions for monolithic 3D integration will also be presented.

Speaker Biography

Krishnendu Chakrabarty received the B. Tech. degree from the Indian Institute of Technology, Kharagpur, in 1990, and the M.S.E. and Ph.D. degrees from the University of Michigan, Ann Arbor, in 1992 and 1995, respectively. He is now the John Cocke Distinguished Professor and Department Chair of Electrical and Computer Engineering, and Professor of Computer Science, at Duke University.

Prof. Chakrabarty is a recipient of the National Science Foundation CAREER award, the Office of Naval Research Young Investigator award, the Humboldt Research Award from the Alexander von Humboldt Foundation, Germany, the IEEE Transactions on CAD Donald O. Pederson Best Paper Award (2015), the ACM Transactions on Design Automation of Electronic Systems Best Paper Award (2017), and over a dozen best paper awards at major conferences. He is also a recipient of the IEEE Computer Society Technical Achievement Award (2015), the IEEE Circuits and Systems Society Charles A. Desoer Technical Achievement Award (2017), the Semiconductor Research Corporation Technical Excellence Award (2018), the IEEE Test Technology Technical Council Bob Madge Innovation Award (2018), and the Distinguished Alumnus Award from the Indian Institute of Technology, Kharagpur. He is a Research Ambassador of the University of Bremen (Germany) and a Hans Fischer Senior Fellow at the Institute for Advanced Study, Technical University of Munich, Germany. He is a recipient of the Japan Society for the Promotion of Science (JSPS) Fellowship in the “Short Term S: Nobel Prize Level” category. Prof. Chakrabarty is a recipient of multiple IBM Faculty Awards and HP Labs Open Innovation Research Awards.

Prof. Chakrabarty's current research projects include: testing and design-for-testability of integrated circuits and systems; microfluidic biochips; hardware security; machine learning for fault diagnosis and failure prediction; neuromorphic computing systems. He is a Fellow of ACM, a Fellow of IEEE, a Fellow of AAAS, and a Golden Core Member of the IEEE Computer Society. He has served as a Distinguished Visitor of the IEEE Computer Society (2005-2007, 2010-2012), a Distinguished Lecturer of the IEEE Circuits and Systems Society (2006-2007, 2012-2013), and an ACM Distinguished Speaker (2008-2016). Prof. Chakrabarty served as the Editor-in-Chief of IEEE Design & Test of Computers during 2010-2012, ACM Journal on Emerging Technologies in Computing Systems during 2010-2015, and IEEE Transactions on VLSI Systems during 2015-2018.

To arrange a meeting with the speaker, please contact Prof. Sudeep Pasricha, Sudeep.Pasricha@colostate.edu.

Upcoming Distinguished Lectures

October 14

Augmented Reality as the Future of Personal Computing

11 a.m.-12 noon



Morgan Library Event Hall

Dr. Doug Bowman

November 11

Usability in Health and Medical Contexts

11 a.m.-12 noon



Morgan Library Event Hall

Dr. Kirk St. Amant

December 2

Urban Data Science

11 a.m.-12 noon



Morgan Library Event Hall

Dr. Claudio Silva