Einladung zum Vortrag

06. Dezember 2022, 10.00 Uhr c.t.
Universität Bremen | MZH | 4380

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Enabling the New Semiconductor Revolution through Advances in Design-for-Yield, Design-for-Test, and Fault-Origin Analysis

During the past year, there has been a remarkable resurgence worldwide in semiconductor research and investments in microelectronics education. For example, the CHIPS and Science Act in the United States provides over $50 billion for semiconductor research, development, manufacturing, and workforce development. In response, major semiconductor companies such as Micron. Qualcomm, and GLOBALFOUNDRIES have already committed an additional $50 billion for chip manufacturing. These developments provide an unprecedented opportunity for university research and university/industry/government partnerships in semiconductors. In this talk, I will first provide an overview of our research on design-for-testability of 3D integrated circuits, silicon lifecycle management, microfluidics, and hardware security, which all involve close industry collaborations. I will next describe in more detail our recent work on design-for-yield that targets manufacturing imperfections for layouts based on emerging carbon nanotube field-effect transistors. Following this, I will present our ongoing work on built-in self-test of monolithic 3D integrated circuits. Finally, I will describe a test and diagnosis technique to characterize fault origins in inter-tier vias and resistive random-access memories for monolithic 3D integration.

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 of Electrical and Computer Engineering at Duke University. He will move to Arizona State University at the end of 2022 as the Fulton Professor of Microelectronics and Director of a new Center on Semiconductor Microelectronics.

Prof. Chakrabarty is a recipient of the Humboldt Research Award from the Alexander von Humboldt Foundation, Germany, the IEEE Transactions on CAD Donald O. Pederson Best Paper Award (2015), the IEEE Transactions on VLSI Systems Prize Paper Award (2021), 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 IEEE Circuits and Systems Society Vitold Belevitch Award (2021), the Semiconductor Research Corporation Technical Excellence Award (2018), the Semiconductor Research Corporation Aristotle Award

(2022), the IEEE-HKN Asad M. Madni Outstanding Technical Achievement and Excellence Award (2021), and the IEEE Test Technology Technical Council Bob Madge Innovation Award (2018). He is a Research Ambassador of the University of Bremen, and he was a Hans Fischer Senior Fellow at the Institute for Advanced Study, Technical University of Munich during 2016-2019. He is a 2018 recipient of the Japan Society for the Promotion of Science (JSPS) Invitational Fellowship in the "Short Term S: Nobel Prize Level" category.

Prof. Chakrabarty's current research projects include: design-for-testability of 3D integrated circuits; AI accelerators; microfluidic biochips; hardware security; AI for healthcare; neuromorphic computing systems. He is a Fellow of ACM, IEEE, and AAAS, and a Golden Core Member of the IEEE Computer Society. 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.

Dieser Gast wurde von Rolf Drechsler eingeladen.