

UCSB-Stanford Collaboration Earns Outstanding Paper Award at the 2005 VLSI/ULSI Multilevel Interconnection Conference

Ongoing collaboration between Kaustav Banerjee, an associate professor of electrical and computer engineering at the University of California, Santa Barbara, and Kenneth E. Goodson, an associate professor of mechanical engineering at Stanford University has been recognized through the Outstanding Graduate Student Paper Award at the recently held 2005 International VLSI/ULSI Multilevel Interconnection Conference (VMIC).

The paper titled, "Thermal scaling analysis of multilevel Cu/low-k interconnect structures in deep nanometer scale technologies," co-authored by Sungjun Im, Navin Srivastava, Kaustav Banerjee and Kenneth E. Goodson, provides realistic estimates of the cumulative impact of self-heat generation in multilayered nano-dimensional metal interconnects on the non-uniform thermal environments that are prevalent in very large scale integrated circuits (VLSI). It presented, for the first time, a systematic scaling analysis of thermal profiles in multilevel interconnect structures that are used for connecting millions of transistors in modern high-performance integrated circuits (ICs) including microprocessors. The analysis illustrates how increasing metal resistivity due to continuous scaling of wire dimensions and decreasing thermal conductivity of insulating dielectric materials calls for advanced thermal management strategies to avoid performance and reliability degradation in these ICs. A more detailed version of the work is due to appear in the IEEE Transactions on Electron Devices in December, 2005.

Navin Srivastava is a graduate student in the electrical and computer engineering department at UCSB and is working towards the doctoral degree under the tutelage of Professor Banerjee. Sungjun Im is a graduate student in the materials science and engineering department at Stanford University and his doctoral research is being jointly supervised by Professors Banerjee and Goodson.

VMIC 2005, which was held in Fremont, CA October 3-6, is the oldest conference that is entirely focused on VLSI interconnection issues. The award, which was based on the technical content, proceedings write-up and oral presentation, consists of a certificate and a cash grant.

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