Course Announcement

CSCE 932, Spring 2007: Fault Tolerance

Credit Hours (3 cr)

Tu, Th: 2:00-3:15, AvH 347

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This offering of the course will take a broader view of fault tolerance in light of three emerging trends: (1) primacy of low-power issues in both high-volume and high-performance designs, (2) feature scaling that allows multicore system-on-chip (SoC) processors on the same die, together with an interconnect network-on-chip network (NoC), and (3) the dynamic nature of the deep-submicron noise effects in the nanometer technologies.

We will discuss low-power and hot-spot concerns that necessitate temperature-aware design and test techniques spanning multiple levels of abstraction, from algorithmic to register-transfer, to gate and circuit levels. We will consider the rationale for packet-switching in high-performance multicore systems, as opposed to a traditional interconnection network, and then discuss the new testing problems introduced by the network on a chip. Finally, we will discuss techniques to combat *upsets* due to nanotechnology, including online and concurrent testing.

The course will be organized so as to provide the necessary background in VLSI design and testability in the first few weeks. During the rest of the semester we will delve into advanced topics mentioned above, making use of journal and conference reprints available from UNL's digital library, supplemented where necessary, with my own personal collection. The latter part of the course will be in the seminar-style with active participation and contributions by students by way of individualized projects and presentations.

The changed focus of the course should interest all CSE graduate students working in the systems area. It should also be of interest to graduate students in EE working in the digital and communications areas. The formal prerequisite for the course is a course in VLSI design, however, a junior/senior level course in logic design should suffice. The most important prerequisite is an interest in the topics mentioned above and a curiosity to learn. If you have any question about your preparation for the course, feel free to contact me by email or phone.

I will be positing updates and more information at the course website: <u>http://cse.unl.edu/~seth/932/</u>