IEEE
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Technical Committee

IEEE DATC Newsletter

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Message from the Chair

As the third quarter of 2007 progresses, the Design Automation Technical Committee is reaching full gear in its new era of resurgence. DATC has refined its mission to focus on technology for design automation techniques in design processes of computer and electronic systems. Our emphasis is on emerging sectors and education, including system-level design, global design, and manufacturability, with increasingly more sustained contributions at leading events and collaboration with leading organizations.

DATC Conferences

The following is a list of conferences that DATC sponsors and / or supports:

Conference	Acronym	Dates	General Chair
Computer Design	ICCD	October 8th – 10th, 2007	Kevin Rudd
Computer Aided Design	ICCAD	November 5th – 8th, 2007	Georges Gielen
High Level Design Validation and Test	HLDVT	November 7th – 9th, 2007	Michael Hsiao
Design Automation and Test	DATE	April 16th – 20th, 2007	Rudy Lauwereins
Microelectronic Systems Education	MSE	June 2nd – 3rd, 2007	Mark Johnson
Electronic Design Processes	EDP	April 12th & 13th, 2007	Bhanu Kapoor
Formal Methods and Programming Models for Codesign	MEMOCODE	May 30th – June 2nd, 2007	Monique Simonetti
Hardware Software & Systems Synthesis	Codes + ISSS	September 30th, 2007	Soonhoi Ha and Kiyoung Choi
Embedded Systems Week (combines CODES+ISSS, EMSOFT and CASES)	ES-Week	September 30th – October 5th, 2007	Christopher Kirsch

Summary of our EDP Symposium

The 14th IEEE DATC Electronic Design Processes (EDP) Workshop, Monterey, CA, April 11-13, 2007, Report by Bhanu Kapoor (Chair, EDP 2007)

The Fourteenth IEEE DATC Electronic Design Processes Workshop (EDP 2007) was held under the auspices of the IEEE Computer Society and the Electronics Design Process Subcommittee (EDPS) of the Design Automation Technical Committees (DATC) at Monterey, CA, April 11-13, 2007.

This year's meeting was put together around the themes of methodologies for dealing with Power and DFM issues. We had a strong program this year with focused sessions in the following areas:

- Power Issues and Methodologies
- Design for Manufacturing Issues and Methodologies
- Emerging EDA Standards
- Multi-Core Programming Crisis

We are at the crossroads of many fundamental changes that are taking place in the semiconductor industry. Power has become one of the most important differentiating factors for semiconductor products due to a major shift in market towards handheld consumer devices. The chip design process can no longer turn a blind eye to the manufacturability issues due to the substantially increased cost of production and shorter product cycles. These changes are also driving an urgent need for EDA standards to be put in place. Power is one of the key reasons for the move towards multi-core architectures and multi-core programming has become a key challenge facing the entire industry.

Invited speakers from ARM, Freescale, IBM, Intel, Magma, Mentor, NXP, QualComm, Synopsys, Si2, Texas Instruments, and many more organizations shared their thoughts on these critical issues facing the industry. A complete list of speakers and the presentations can be found at the EDP 2007 website [1]: www.eda.org/edps.

Summary of DATE 2007

D.A.T.E. was extremely successful this year. The most obvious success was the location. Both Nice and the conference facilities more than made up for the loss of Paris as a venue. But far more important was the fact that they have finally succeeded in turning D.A.T.E. into a true Electronic System Design Conference.

Europe has been always a systems oriented design environment. During the initial efforts at designing the 3G phone Europe became aware of the major negative impact that embedded Software was having on these new systems. That grew into the realization that it had become impossible to address electronic design without including the Embedded Software Engineers in the discussion. That was not lost on the D.A.T.E. committee, for they realized that their conference would shrink, or worse become irrelevant, if they were unable to attract the entire design community, both hardware and software to their show. After years of trying this year they succeeded.

As I prepare for DAC each year I call up my User clients and ask them what were the most difficult design issues they were facing during the year.

Usually I get three or four “Hot” items and then I concentrate on those topics on my What To See @ DAC list. This year I discovered five Hot issues; Software, Software, Software, DFM and Power.

The first software issue, and the most pressing, was Amdahl’s Law’s limitation on using more than four microprocessors in a general purpose computing environment. The key here is “general purpose” we’ve been using parallel processing to address Embarrassingly Parallel Problems for quite some time now. However in today’s Von Neumann based, sequential programming environment. Amdahl’s Law pretty much spells out the end of parallel processing, for general purpose computers, at four homogeneous processors. That is the Homogeneous multi-processing problem.

The second issue was the Heterogeneous Processor problem. Cell phones are usually mentioned in this context. Can we do it … yes. Can we do it efficiently, the answer is decidedly no. Most designs today are based on Padded Cell architectures, which were borrowed from the security community. Basically each application becomes its own stand-a-lone function, its own processor, its own memory, its own I/O, etc. There are some minor improvements on the concept but all and all these designs are pretty ugly. This is not the world of optimized resources, and in the world of cell phones the power problem demands optimization.

The third software problem is hardware/software partitioning. The European 3G phone efforts proved the point; 80ish percent of the power optimization “must” be accomplished at the initial HW/SW partitioning. Ties in nicely with the fifth hot issue doesn’t it.

At panel session after panel session this year the questions from the audience were on the three software issues. This year’s attendees were a good mix of hardware and software engineers. The software crisis was on everyone’s minds. D.A.T.E has become a truly Electronic System Design Conference.

Contribution Opportunities

The IEEE DATC welcomes proposals for contributions to this newsletter. Contributions should shed light on non-obvious key EDA trends. Educational contributions in emerging areas such as ESL and DFM are especially welcome. The ideal length of a contribution is a half a page in the form of a short fact-based essay with data or references backing the stated position, but longer contributions may be considered. Publication of important graphics and data tables might be possible by request. Please send proposals in the form of a 2-paragragh abstract to the editors at jantonio@ieee.org.