EE Times:

IC routing contest boosts CAD research

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An IC global routing contest at the International Symposium on Physical Design (ISPD) this week (March 20) produced more than happy winners — it showcased new directions for research in IC routing algorithms.

11 teams from academic and research institutes participated in the ISPD contest, which was organized by IBM and sponsored by the ACM Special Interest Group on Design Automation (SIGDA), IEEE Council on Electronic Design Automation (CEDA) and the Semiconductor Research Corporation. "The purpose of the contest is to guide researchers toward most urgent challenges in the EDA industry, and also to map out state-of-the-art solutions," said ISPD 2007 chair Patrick Madden, professor at the State University of New York.

"High-quality and publicly available global routers will be very helpful for CAD research," said Lou Scheffer, Cadence Design Systems fellow and ISPD 2006 chair. The contest, he noted, will help provide more realistic requirements for IC placement algorithms. "This should lead to better placers in fairly short order," Scheffer said. "Also, existing global routers should make it easier to build an academic detailed router — perhaps our contest for next year."

Under the direction of Gi-Joon Nam from IBM's Austin Research Laboratory, a team of IBM engineers and university researchers defined performance metrics for the contest, generated benchmarks from recent IBM circuits, wrote evaluation scripts, and performed final scoring. Routers were compared based on the number of routing violations (overflows) and total routing wire length. Entries were scored separately for 2D and 3D routing.

David Pan, ISPD 2007 program chair and professor at the University of Texas at Austin, noted that there's still some controversy over the methods used to compare routers. He noted that BoxRouter from the University of Texas, which placed second in the 3D category, actually completed the largest number of circuits. "The ISPD community is still trying to define a good metric," Pan said.

The winning entry in the 2D category was "Fairly Good Router" (FGR), written in one month by Jarrod Roy, graduate student from

the University of Michigan. FGR also took third place in the 3D contest. "We plan to open-source it to boost research in routing and help improve commercial EDA tools," said Igor Markov, professor at the University of Michigan.

The winner of the 3D category was MaizeRoute, written in one month by Michael Moffitt, PhD candidate at the University of Michigan. It also took second place in the 2D category. MaizeRoute draws upon Moffitt's research in artificial intelligence.

MaizeRoute contains only 1,500 lines of code. "I am very pleased that some of the simplest algorithms won in this contest," Madden said. "This will keep routing research practical and relevant to real-world applications."

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