DAC/ISSCC Student Design Contest

Guidelines for Submission
The Student Design Contest is organized by the Design Automation Conference (DAC) and the International Solid State Circuits Conference (ISSCC) to promote excellence in the design of electronic systems by providing competition between graduate and undergraduate students at universities and colleges. The contest is sponsored by DAC, ISSCC and a number of semiconductor and EDA companies.

Criteria for Entering the Contest
Submissions are invited from full-time graduate and undergraduate students. The design work submission must have taken place as part of the students’ course or research work at the university and must have been completed within 18 months prior to the submission deadline: 5:00pm MT, Wednesday, November 24, 2010.

There are three categories for the Student Design Contest submissions: Operational chip design, System-level design and Conceptual design.

- Operational chip designs have been implemented and tested. Proof of implementation in the form of die- or board-photographs and measurement data must be supplied.
- System-level design implemented with commercial off-the-shelf ICs and programmable devices (e.g. FPGA). Proof of implementation in the form of system setup photographs and measurement data must be supplied.
- Conceptual designs need not have been implemented but must have been thoroughly simulated and must include a test plan.

Designs can be for analog, digital, or programmable circuits and systems. Submissions can be embodied as integrated circuits, reconfigurable processors, SOCs, platform-based or embedded systems designs. Examples include:

- Analog Integrated Circuits
- Digital Integrated Circuits
- FPGA-Based Designs
- Reconfigurable Processors
- SoC / Platform-Based Designs
- Embedded Systems
- MEMS/Optics/Bio-Chips

The project must fall within the design areas described above. The project can originate from:

- Undergraduate Class Work
- Undergraduate Research Work
- Graduate Class Work
- Graduate Research Work

The design work must have taken place at an academic institution. Students must submit descriptions of their designs, up to six written pages including the abstract and not more than ten diagrams and figures. They will be evaluated on the following criteria:

- Motivation/Justification (Why was this done?)
- Description of the design process (How was this done?)
• Description of EDA tools and methods used (How did they facilitate the design activity?)
• Functional description of final project (How does it work?)
• Physical description, size, speed, power, etc. (How well does it perform?)
• Testing strategy and results (Simulation for Conceptual category) (Did it work?)
• Future work (How can the design/work be extended?)
• Summarizing conclusions from the work (What was learnt?)

Submitted designs must not have received awards in others contests. If the design has been accepted as a regular paper for presentation at ISSCC, a companion student design contest submission must have substantially different content. Resubmission of the same material will be rejected. The student design contest submission must describe in detail the motivation, project work undertaken, methods and CAD tools used, results and conclusions. Follow the content guidelines outlined in the next section.

Submitting a Design
Submissions must be in the DAC paper format, and must be submitted electronically via the DAC website (www.dac.com). Submissions must include the title, a 60-word abstract, and the document describing the design, not to exceed six written pages including the abstract and not more than ten diagrams and figures attached. The deadline for submission is 5:00pm MT, Wednesday, November 24, 2010. Refer to the DAC website, "Call for Papers," for additional information. Be sure to read the sections titled "Regular Papers due November 18, 2010" for layout and file format requirements, and "Student Design Contest due November 24, 2010". Unlike DAC papers being submitted for review, do list the author's name(s) and affiliation(s) on your SDC submission.

It is appropriate for a professor to be included as a co-author if he/she was instrumental in your approach to the design, or provided other guidance that contributed to the success of your design.

It is also appropriate for an industry member to be acknowledged in the text as a mentor of the work if he/she provided general guidance to the design team. Mentors are not allowed to participate in the design in any manner, nor may they receive any portion of any awards given. This is intended as a way of thanking mentors and encouraging increased industry support. Mentors may be acknowledged both at ISSCC and at DAC in both posters and presentations. Industry members cannot serve as mentors if they are organizationally affiliated with any of the Student Design Contest judges. Entries in violation will be disqualified."

Writing style should be clear and concise. Remember that the judges' expertise may not be in the area of your project. Make your explanations straightforward and understandable.

Design for testability is important. Discuss testing issues you have considered in the design, and approaches you took or will take in testing. Engineering specifications and performance statistics can be efficiently presented in tabular form.

You may want to address some of the following questions and issues in your written report:

System Overview
• Motivation for designing the chip or system.
• Is the implementation medium appropriate?
• Does this design satisfy the system requirements?
• What is unique about this project?
● What novel ideas or elegant solutions does the design include?

Implementation and Engineering Considerations
● Specifications: functional, timing, electrical, and environmental (temperature).
● Trade-offs: architectural and circuit trade-offs, I/O considerations, floorplanning and interconnect approaches. Emphasis should be placed on why you did what you did.
● Timing and Critical Paths. What clocking scheme is used? Why?
● Which paths are critical? Have you simulated or measured their delays?
● Block Diagram, Logic / Circuit Diagrams, and Algorithms.
● What role did design automation tools play in the implementation of your design?
● Photo or Final Layout Plot (annotate so various blocks can be identified).
● Verification/Simulation (keep it brief): how did you assure that the chip would work as specified?

Testing
● How did you, or will you, test this part with I/O pins only?
● What test equipment did you use?
● Actual test results, if available, should be summarized.

Statistics
● Die size, total power, number of transistors, density of layout, maximum clock speed, etc.

Judging
A panel of experts from industry and academia will judge the submissions. Judging criteria will include originality, soundness of engineering, technical difficulty, innovation, measured performance and testing, analysis and discussion of results, conclusions, and the quality of the written submission.

Contest Awards
Winners will receive a financial award and a design contest award certificate of achievement. Awards will be given at the Design Automation Conference in June 2011, San Diego, CA.
Winners will attend ISSCC 2011 and DAC 2011 for student contest presentations. Award winners will be notified prior to the conference and may be offered travel assistance to attend the conferences. Selected winning entries may be included in the DAC technical program at the discretion of the technical program committee.