Leading Edge Technology for Brazil’s IC design Eco-System

The CAD role in Brazil’s IC design Eco-System

The development of Integrated Circuits is a highly complex task which requires the coordination of specialists with very deep technical knowledge from various domains. Traditionally Semiconductor companies have quite large CAD teams who are in charge of establishing and maintaining design infrastructure for design groups, who themselves focus on the application domain. CAD groups must understand the specific requirements of the design domains, the foundry technologies, and last but not least the methodologies and the EDA technology. CAD teams identify the right technology, create such an infrastructure, maintain it, and teach the designers how to apply respective techniques. A continuous challenge is to identify the automation technology that matches the requirements for design, and in many cases CAD groups find themselves even creating proprietary automation solutions.

The Semiconductor Ecosystem in Brazil currently consists of one Foundry, two training centers, and about 20 design houses, and last but not least several universities. From the beginning NSCAD is focused on fulfilling the CAD function for the ecosystem. It played a key role in establishing the training centers in Porto Alegre and Campinas, initially training the staff and then staffing the trainings and training several hundred designers already.

Competitive capabilities for Brazil

NSCAD has taken the next steps beyond training to provide the complete CAD function as a service to Brazilian design houses. Such services include
• Installation and configuration of design environments
• General CAD services upon request
• Investigation of leading edge solutions*
• Consulting for prototyping
• Teaching – formal classes and on-the-job
• General communication and negotiation with international suppliers

* One of the investigated solutions that has been adopted by NSCAD is the WiCkeD tool suite from MunEDA. It works on top of the common EDA frameworks and provides very thorough behavioural circuit analysis, solid verification, and sizing tools to increase productivity, yield and robustness - good tools to help solving the nanometer design challenges.

Eric Fabris, Chief Technology Officer, NSCAD, Porto Alegre:
“If we would not look at EDA technology beyond the standard EDA Framework we would always find ourselves in disadvantage over competition. Of course it is challenging to judge what technology is worth to adopt, but we spend the effort to build this expertise and analyse EDA technology and provide such expertise & CAD service to all design houses in Brazil. That’s economy of scale.”

About NSCAD
NSCAD provides support and training in IC design flow using EDA software, mainly directed to research and development centers, universities and design houses in Brazil and South America. NSCAD’s service range from IC EDA tool training to development, installation and configuration of EDA professional environments. The IC Brazil training center #1 (CT1) is located in Porto Alegre to take advantage of the NSCAD expertise in IC design flow and EDA tool training.
For further information visit http://www.nscad.org.br/

MunEDA

WiCkeD tool suite in the training program

The IC Brazil training program is divided into two phases. During the first phase (5 months), the students receive lectures on general topics about semiconductors and an intensive course on their specialization field (Mixed-Signal, RF or Digital). Alongside the lectures, the students follow lab tool training and do assisted designs. During the second phase (7 months) the students work together as a team to design a complete AMS/RF transceiver for IEEE 802.15.4 PHY layer. A real company environment is simulated.
When dealing with recent node technologies, MunEDA WiCkeD saves a lot of time and unnecessary effort in analog and mixed-signal sizing and verification, also leads to optimized design results. Therefore it is included in the training program and already presented early in the first phase.

How WiCkeD is taught

Education phase (5 months)

Assisted designs
• Sensitivity analysis and
• Diagnosis
• Analog verification
• Yield improvement

Project phase (7 months)

Full 802.15.4 transceiver design
• Analog verification after manual sizing
• Manual sensitivity analysis / diagnosis
• Automated sizing
• Without considering variability (DNO)
• Considering variability (YOP)

In the education phase the designers are firstly shown how to use sensitivity analysis and diagnosis to get a better circuit understanding while designing it, then the circuit is verified. Any issues found during verification are improved through the use of WiCkeD.
During the project phase the designers are guided to also use WiCkeD automated sizing tools and consider statistical variations that affect the circuits performances. This is a growing need as process technologies advance.

MunEDA WiCkeD™

Evertón Ghignatti, AMS Team Lead, NSCAD, Porto Alegre: ”With WiCkeD we have found an example that clearly helps to improve quality, reduce design time and provide thorough systematic verification for high confidence at tape-out. We are happy that we have access to such leading edge technology and can prepare our students with methodologies beyond the fundamental IC design training. I like to prepare them as well as possible for the competition in commercial design projects.”

About MunEDA
MunEDA provides leading EDA technology for analysis and optimization of performance and yield of analog, mixed-signal and digital designs. MunEDA’s products and consulting enable customers to reduce the design times of their circuits and to maximize robustness and yield. MunEDA’s solutions are in industrial use by leading semiconductor companies in the areas of communication, computer, memories, automotive, and consumer electronics.
For further information visit www.muneda.com.