Synopsys Partners with Indian Institute of Technology Bombay to Develop Talent for Semiconductor Industry

Executives from the Indian Institute of Technology Bombay (IIT Bombay) and Synopsys celebrate the inauguration of the Synopsys Semiconductor Lab for Virtual Fab Solutions at the IIT Bombay campus in Mumbai, India.

Synopsys Semiconductor Lab for Virtual Fab Solutions Nurtures the Next Generation of Semiconductor Engineers to Address Global Engineering Talent Shortage

Highlights:

- Synopsys Academic & Research Alliances provides software, course content, training, and scholarships to support the new Synopsys Semiconductor Lab for Virtual Fab Solutions at the Indian Institute of Technology Bombay.
- Hands-on training enables students to gain knowledge and real-world experience to advance semiconductor innovation.
- Facilitates research on design technology co-optimization to evaluate next-generation materials, process technologies, and devices.

SUNNYVALE, Calif., October 16, 2023 /PRNewswire/ – Synopsys, Inc. (Nasdaq: SNPS) and the Indian Institute of Technology Bombay (IIT Bombay) today announced the inauguration of the Synopsys Semiconductor Lab for Virtual Fab Solutions at IIT Bombay as part of the Department of Electrical Engineering under the Center for Semiconductor Technologies (SemiX). With the semiconductor industry facing a major talent shortage to meet anticipated future semiconductor demand, SemiX was established at IIT Bombay to provide an interdisciplinary platform for industry-focused research and education, entrepreneurship, and policy studies.

The new lab will provide engineering students with software solutions to cultivate knowledge on how to develop new technologies that will help advance semiconductor process technology development. Technology computer aided design (TCAD) tools donated by the Synopsys Academic & Research Alliances (SARA) initiative will be used by students, professors, and industry allies for hands-on experience with the latest process technologies, materials, and device architectures.

The interdisciplinary focus of the new Synopsys lab intrinsically resonates with SemiX where the “X” spans materials, processes, and devices to circuits, systems, and packaging in the semiconductor world. The center features more than forty-five faculty specializing in electrical and mechanical engineering, materials science, physics, and chemistry with additional world-class labs, including the IITB Nano Fab and VLSI Design Lab that run flagship national training programs in technology and design. IIT Bombay has played a central role as India grows its strength in nanoelectronics research.

TCAD is foundational to the development of semiconductor technology by enabling engineers to explore design technology co-optimization (DTCO) techniques and perform cost-effective and accurate experiments that ultimately improve quality of results and time to results in the semiconductor product lifecycle. Synopsys TCAD solutions utilize computer simulations based on physics models and machine learning approaches to predict the changes in the behavior of semiconductor materials, devices, and structures from node to node. The solutions enable engineers to complete critical design development phases including the process level to mimic steps in fabrication and the device level to simulate how electrical currents move through a device.

The shortage of engineering talent, especially those with expertise in semiconductor process development and manufacturing, is already delaying the ability to operationalize new fabs around the world. Nurturing more process engineers on an automated approach is critical to advance research of new semiconductor materials and architectures, and to bring new fabs online to meet the world's growing demand. Enabling more access to industry-leading software-based tools can add critical talent and promote systematic thinking and industry innovation in crucial areas such device architecture, interconnects, and materials.

Synopsys and IIT Bombay have a long history of collaboration on research and development (R&D) as well as education and training in semiconductors, including a first-of-its-kind week-long hands-on online training program in process, device, and circuit simulation for Indian academia. This collaborative momentum has culminated in the establishment of the Synopsys Semiconductor Lab for Virtual Fab Solutions to amplify the organic engagement.

The Synopsys Semiconductor Lab for Virtual Fab Solutions will be available to students by the end of the year. The enablement of the lab echoes the SARA program's commitment to be the preferred partner for workforce development and promote semiconductor talent pipelines around the world. In addition to equipping the lab with tools, the SARA program will also provide related course content, training, and scholarships.

What Industry Leaders Are Saying
Here's what industry leaders are saying about the new Synopsys Semiconductor Lab for Virtual Fab Solutions at IIT Bombay:

"IIT Bombay has pioneered world-class research and education in semiconductor technology and design," said Professor Subhasis Chaudhuri, director, IIT Bombay, speaking about the collaboration. "The Synopsys Semiconductor Lab for Virtual Fab Solutions builds on our past collaboration in semiconductor research and education to boost India Semiconductor Mission's efforts to grow the semiconductor ecosystem by infusing innovation and talent at the global scale."

"The industry is approaching a crossroads marked by growing demand for increasingly advanced silicon chips and an engineering talent shortage that threatens to stifle innovation," said Raj Nair, vice president of Product Management at GlobalFoundries and member of the IIT Bombay SemiX Advisory Board. "Today, more than ever before, the world needs top talent for the significant growth expected in the semiconductor industry. The Synopsys Semiconductor Lab for Virtual Fab Solutions at IIT Bombay is an excellent example of how industry and academia collaboration can help produce the trained professionals our industry needs."

"Software simulation tools can help speed the adoption of new materials and architectures, which are key to enabling higher performance, more power-efficient chips for the IoT and AI era of computing," said Anantha Sethuraman, general manager of Strategic Programs, Semiconductor Products Group at Applied Materials. "Applied has a long history of collaboration with IIT Bombay, and the addition of Synopsys' new Semiconductor Lab for Virtual Fab Solutions at the university will provide valuable resources to engineering students looking to become the next generation of innovators in the semiconductor industry."

"As the global leader in EDA and AI solutions, we believe that addressing the engineering talent shortage is essential to the future of semiconductor technology innovation," said Shankar Krishnamoorthy, general manager of the EDA Group at Synopsys. "We are excited to collaborate with IIT Bombay on nurturing the next generation of engineers to unlock the semiconductor industry's full potential. As a graduate of IIT Bombay, I have benefited greatly from the world-class faculty at this distinguished institution and expect the new Synopsys Semiconductor Lab for Virtual Fab Solutions to make significant contributions to the industry."

Additional Resources

- What Is TCAD and Why Is It Essential for the Semiconductor Industry?
- Using TCAD Simulations to Design Reliable Space-Based Chips
- Why DTCO Is Critical to Modern Memory Design Techniques
- India's Growth in Nanoelectronics Research
- Learn about IIT Bombay Center for Semiconductor Technologies (SemiX) and India Semiconductor Mission

About Synopsys
Synopsys, Inc. (Nasdaq: SNPS) is the Silicon to Software™ partner for innovative companies developing the electronic products and software applications we rely on every day. As an S&P 500 company, Synopsys has a long history of being a global leader in electronic design automation (EDA) and semiconductor IP and offers the industry's broadest portfolio of application security testing tools and services. Whether you're a system-on-chip (SoC) designer creating advanced semiconductors, or a software developer writing more secure, high-quality code, Synopsys has the solutions needed to deliver innovative products. Learn more at www.synopsys.com.

About Indian Institute of Technology Bombay
Indian Institute of Technology Bombay, set up in 1958 as the second IIT, is recognized worldwide as a leader in the field of engineering education and research. The Institute was granted the status of 'Institution of Eminence' by the Ministry of Education (the then Ministry of Human Resources Development) on July 9, 2018. IIT Bombay is reputed for the quality of its faculty and the outstanding calibre of students graduating from its undergraduate and postgraduate programs. The Institute has

16 academic departments, 31 (Centers/ Programs/ Academic facilities), three schools and four Interdisciplinary programs. Over the last six decades, more than 70,000 engineers and scientists have graduated from the Institute. It is served by more than 715 faculty members considered not only amongst the best within the country but also highly recognized in the world for achievements in the field of education and research. IIT Bombay is not only amongst the best in the country but also highly recognized in the world for achievements in the field of education and research. On June 28, 2023, IIT Bombay has been ranked first in India and 149th globally in Engineering and Technology by the Quacquarelli Symonds (QS). For the first time, the Institute broke into the top 150 universities in the QS World University Ranking 2024.

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