Synopsys.ai Unveiled as Industry's First Full-Stack, AI-Driven EDA Suite for Chipmakers

Market Leaders to Share Perspectives on AI in Design, Analog, Verification, Test and Manufacturing at Synopsys Users Group Conference

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Key Highlights:

- Synopsys.ai provides AI-driven solutions for chip design, with digital and analog, verification, test and manufacturing components.
  - AI engines significantly boost engineering productivity and silicon quality while minimizing costs.
- NVIDIA, TSMC, IBM, MediaTek and Renesas all support Synopsys' AI-driven EDA design strategy with significant benefits already being seen:
  - Renesas achieved a 10x improvement in reducing functional coverage holes and up to 30% increase in IP verification productivity.

At its annual Synopsys Users Group (SNUG) Silicon Valley Conference, Synopsys, Inc. (Nasdaq: SNPS) today launched Synopsys.ai, a suite of AI-driven solutions for the design, verification, testing and manufacturing of the most advanced digital and analog chips. For the first time, engineers can now use AI at every stage of chip design, from system architecture to design and manufacturing, and access the solutions in the cloud. Renesas, a leader in the automotive space, is already using Synopsys.ai to shave weeks off product development times with enhanced silicon performance and cost reduction.

The Synopsys.ai EDA suite includes AI-driven solutions:

- Digital design space optimization to achieve power, performance and area (PPA) targets, and boost productivity (used in 100 production tape-outs by January 2023).
- Analog design automation for rapid migration of analog designs across process nodes.
- Verification coverage closure and regression analysis for faster functional testing closure, higher coverage and predictive bug detection.
- Automated test generation resulting in fewer, optimized test patterns for silicon defect coverage and faster time to results.
- Manufacturing solutions to accelerate development of lithography models with high accuracy to achieve the highest yield.

"Increased complexity, engineering resource constraints and tighter delivery windows were challenges crying out for a full AI-driven EDA software stack from architectural exploration to design and manufacturing – and we've delivered it," said Shankar Krishnamoorthy, GM of Synopsys EDA Group. "With Synopsys.ai solutions, our customers' ability to search design solution spaces across multiple domains is in hyperdrive. They're finding optimal results far faster as the .ai learns run-to-run, and it's transforming their ability to meet and beat tough design and productivity targets."

Learn more about Synopsys.ai EDA solutions from our blog:https://blogs.synopsys.com/from-silicon-to-software/2023/03/29/synopsys-ai-eda-tools/

Industry Leadership in AI-driven Semiconductor Design
Synopsys.ai tools are now in use by 9 of the top 10 semiconductor companies, establishing Synopsys as an early leader in this space. With each design project, the solutions' AI engines continually train on unique data sets, allowing them to become more adept at optimizing results over time.

Here's what some industry leaders are saying about the AI-driven EDA design suite:
"Meeting quality and time-to-market constraints is fast becoming difficult using traditional human-in-the-loop techniques due to the ramp in design complexity," said Takahiro Ikenobe, IP Development Director, Shared R&D Core IP Division at Renesas. "Using AI-driven verification with Synopsys VCS®, part of Synopsys.ai EDA suite, we've achieved up to 10x improvement in reducing functional coverage holes and up to 30% increase in IP verification productivity demonstrating the ability of AI to help us address the challenges of our increasingly complex designs."

"Achieving the highest quality silicon is essential given our increasingly complex chips that power many of the world's devices," Xian Lu, Director, MediaTek. "We must constantly improve methodologies and deploy new technologies to quickly deliver test programs that provide high defect coverage while minimizing testing cost. AI-driven enhancements for automatic test pattern generation are critical to achieving our future silicon testing goals."

"TSMC works closely with our Open Innovation Platform® (OIP) partners like Synopsys to enable our customers to improve productivity and accelerate design closure when performing process-to-process design migration of custom and analog blocks," said Dan Kochpatcharin, head of Design Infrastructure Management Division at TSMC. "With the latest Synopsys AI-driven analog design migration flow and TSMC enhanced PDKs, we now enable efficient reuse of designs that are migrating from one of our widely used processes to another and benefit from the power, performance, and area improvements of our latest technologies."

"At advanced technology nodes it is critical to have accurate lithography models for optical proximity correction," Huiming Bu, VP, Global Semiconductor R&D and Albany Operations at IBM Research. "Utilizing AI/ML accelerates the development of highly accurate models that yield the best results during silicon fabrication. We are excited to collaborate with Synopsys on AI-driven mask synthesis solutions that can help our partners reach market faster."

"AI has the potential to reshape virtually every field, and its benefits for the semiconductor industry are hard to overstate," said Vivek K. Singh, VP, Advanced Technology Group at NVIDIA. "We're working alongside leading companies like Synopsys to accelerate and improve production and open new frontiers for the industry."

According to industry analyst Patrick Moorhead from Moor Insights & Strategy: "AI is transforming the semiconductor industry, enabling engineers to create more complex chips that humans unaided would be unable to produce. The horizons AI will open up are hard to imagine, only we know we'll be able to move faster and do more than we can now–including how we tackle major global issues such as hunger, epidemic control and climate change. Synopsys is now clearly taking the lead in infusing AI throughout the chip development flow and we should applaud their investment in the industry's future."

Additional Insights and News

- News release: AI-designed Chips Reach Scale with First 100 Commercial Tape-outs Using Synopsys Technology
- Blog: Charting a Productive New Course for AI in Chip Design
- Blog: What's in Store for AI in 2023?

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.

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