

# Synopsys System Studio Speeds DSP Algorithm Development With New Matrix Data-Type Support

Enhances Model Authoring Efficiency and Simulation Performance Utilizing Multicore Capabilities

MOUNTAIN VIEW, Calif., March 3 /PRNewswire-FirstCall/ -- Synopsys, Inc. (Nasdaq: SNPS), a world leader in software and IP for semiconductor design, verification and manufacturing, today announced important new capabilities in its System Studio C/C++ model-based analysis and simulation environment, further enhancing algorithm developer efficiency. System Studio now offers matrix and vector data-type support, which significantly reduces the coding and debugging effort necessary to author signal processing simulation models. Furthermore, System Studio addresses the need for faster simulation runs by integrating highly efficient parallelized matrix and vector function libraries optimized for multicore systems. These function libraries speed up simulation performance by up to eight times (8x).

System Studio's C/C++ model-based analysis and simulation environment is widely deployed for the design of complex digital signal processing algorithms, including wireless, wireline and multimedia applications. Advanced signal processing standards are defined using matrix and vector notations. Examples range from describing simple filter operations to complex multi-antenna MIMO systems such as LTE or WiMAX. Availability of type-generic matrix and vector data types, plus dedicated functions and operators, significantly increases designer efficiency when authoring a simulation model of these standards. This efficiency is achieved by reducing the necessary number of lines of code by 10 to 100x compared to describing it with generic ANSI-C data types. At the same time, the complexity of these standards requires the highest simulation performance, as unaccelerated single simulation runs easily take hours or even days to complete. System Studio customers already benefit from highly optimized simulation performance through a combination of C/C++ based modeling and advanced compiled simulation techniques. The new multicore support for matrix and vector functions results in further simulation performance improvements up to 8x.

"System Studio allows us to both create models rapidly and simulate quickly to verify standard compliance," said Graham Freeland, chief software engineer at Steepest Ascent, which provides mobile and wireless simulation libraries, professional consulting, and embedded communication systems design. "When developing our LTE physical layer model library for System Studio, we were able to use matrix and vector data types to rapidly transfer the specification into an executable model. The combination of extremely high simulation performance and standards-compliant simulation models enables us to significantly reduce time-to-results."

"System Studio customers are involved in complex, leading-edge signal-processing designs. For them, time-to-results from system specification all the way to a bit-true reference model is of paramount importance," said Markus Willems, senior product marketing manager for system-level solutions at Synopsys. "The availability of matrix and vector data types, operators, and functions benefits System Studio customers in three distinct ways: enhancing designers' efficiency when authoring a model, providing the highest simulation performance, and enabling efficient integration of algorithmic models into hardware and software verification flows."

The new matrix and vector data types, operators and functions are accompanied by a rich model library, delivered as part of System Studio at no extra cost. The model library includes performance-optimized implementations of widely used functions such as linear algebra operations, matrix multiplication, FFT, singular value decomposition and eigenvalue computation. Also, 2D and 3D visualization allows intuitive representation of matrix data.

## Availability

System Studio featuring multicore matrix and vector data-type support is available immediately; existing licensees receive it as a regular maintenance update. For more information go to <http://www.synopsys.com/systemstudio>.

## About Synopsys

Synopsys, Inc. (Nasdaq: SNPS) is a world leader in electronic design automation (EDA), supplying the global electronics market with the software, intellectual property (IP) and services used in semiconductor design, verification and manufacturing. Synopsys' comprehensive, integrated portfolio of implementation, verification, IP, manufacturing and field-programmable gate array (FPGA) solutions helps address the key challenges designers and manufacturers face today, such as power and yield management, software-to-silicon verification and time-to-results. These technology-leading solutions help give Synopsys customers a competitive edge in bringing the best products to market quickly while reducing costs and schedule risk. Synopsys is headquartered in Mountain View, California, and has more than 65 offices located throughout North America, Europe, Japan, Asia and India. Visit Synopsys online at <http://www.synopsys.com/>.

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**Editorial Contacts:**

Sheryl Gulizia  
Synopsys, Inc.  
650-584-8635  
[sgulizia@synopsys.com](mailto:sgulizia@synopsys.com)

Karen Do  
MCA, Inc.  
650-968-8900 ext. 108  
[kdo@mcapr.com](mailto:kdo@mcapr.com)

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