

NNCI Seminar Series

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COMPUTATION TALK: SIMULATION SOFTWARE NEXT DOOR



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Abstract: Advancement in technology is propelling the growth of the semiconductor industry like never before. Semiconductor trends that drive growth within the industry include the introduction of the 5G technology, the increased demand for Artificial Intelligence (AI) chips and AI applications, and Internet of Things (IoT). With more advanced IoT products within the market, starting from industrial automation systems to connected devices powered by semiconductors, IoT is about to supply diversified possibilities to semiconductor organizations.

It is now well known that modeling and simulation is the third alternative to theory and experiments. Modeling and simulation is cheaper, faster and provides insight into physical processes occurring within the device that cannot be measured experimentally. As such, modeling and simulations reduces the time from design to production of a particular device and/or circuit. Simulation models must be validated against available experimental data and be consistent with theoretical predictions.

In this talk, I will present a summary of the available simulation methodologies and products that can be useful to the NNCI community. In particular, I will focus on the capabilities of TCAD tools (such as Silvaco Victory, Synopsys Sentaurus, Comsol, etc.), tools available free of charge on nanoHUB.org, and few examples of in-house simulation tools that have not yet been adopted by the TCAD community.

Bio: Dragica Vasileska (F'2019) received B.S.E.E. and M.S.E.E. Degree from the University Sts. Cyril and Methodius (Skopje, Republic of North Macedonia) in 1985 and 1991, respectively, and a Ph.D. Degree from Arizona State University in 1995. From 1995 until 1997, she held a faculty research associate position within the Center of Solid State Electronics Research at Arizona State University. In the fall of 1997, she joined the faculty of Electrical Engineering at Arizona State University. In 2002 she was promoted to associate professor, and in 2007 to full professor. Her research interests include semiconductor device physics and semiconductor device modeling, with strong emphasis on quantum transport and Monte Carlo device simulations. Recently, her research interests also include modeling metastability and reliability of solar cells. Prof. Vasileska published more than 180 publications in prestigious scientific journals, over 200 conference proceedings refereed papers, 25 book chapters, has given numerous invited talks and is a co-author on three books: "Computational Electronics," D. Vasileska and S. M. Goodnick, Morgan & Claypool, 2006; "Computational Electronics: Semiclassical and Quantum Transport Modeling," D. Vasileska, S. M. Goodnick and G. Klimeck, CRC Press, 2010, and "Modeling Self-Heating Effects in Nanoscale Devices," K. Raleva, A. Shaik, D. Vasileska and S. M. Goodnick, Institute of Physics Publishing, Morgan & Claypool, 2017. She is also an editor of two books: "Cutting Edge Nanotechnology," In-Tech, 2010 and "Nano-Electronic Devices: Semiclassical and Quantum Transport Modeling" (co-editor S. M. Goodnick), Springer, July 2011. Prof. Vasileska is a recipient of the 1998 NSF CAREER Award. Her students have won numerous awards at prestigious international scientific conferences.

