

Integrated Systems

AI/ML for EDA: Learning Algorithms in Analog and Digital Design

Dr. Ioannis Savidis

Associate Professor, Drexel University

Date: Friday, October 18th, 2024, Time: 2:00pm, Location: EEB 132

Zoom Meeting Link: <https://usc.zoom.us/j/94304141343>

Refreshments will be served

Abstract: In the ever-evolving landscape of Electronic Design Automation (EDA), the integration of Artificial Intelligence (AI) and Machine Learning (ML) algorithms with traditional heuristic optimization algorithms has emerged as a transformative force in automated circuit design. This presentation delves into the dynamic intersection of AI/ML and EDA, exploring state-of-the-art techniques shaping the analog and digital physical design space. Machine learning, specifically deep learning, has the potential to significantly improve the accuracy, speed, efficiency, and reliability of EDA tasks such as circuit modeling, simulation, layout design, and optimization. Delving into such cutting-edge advancements, I will describe current AI/ML research performed by the ICE Lab that promises to transcend traditional paradigms, with the goal of enabling designers to navigate complexities with unparalleled efficiency and accuracy. Specifically, a focus on state-of-the-art learning and optimization techniques for the modeling and design of mixed-signal ICs will be presented and discussed. Practical considerations, challenges, and opportunities of ML algorithms for analog and digital circuit design will be discussed, with a focus on the use of such algorithms for prediction and optimization tasks within the EDA design flow.

Biography:



Dr. Ioannis Savidis (S'03-M'13-SM'18) is an Associate Professor in the Department of Electrical and Computer Engineering at Drexel University, where he directs the Integrated Circuits and Electronics (ICE) Design and Analysis Laboratory. He received his B.S.E. from Duke University in 2005, and his M.Sc. and Ph.D. from the University of Rochester in 2007 and 2013, respectively. Dr. Savidis has authored over 130 technical papers in peer-reviewed journals and conferences, including a book on Three-Dimensional Integrated Circuit Design and holds 16 issued and five pending patents. His research interests include high-performance digital and mixed-signal integrated circuits, power management for SoC and microprocessor circuits, hardware security, AI/ML algorithms for circuit optimization, and electro-thermal modeling for 2-D and 3-D circuits. Dr. Savidis is a senior member of IEEE and has received two Best Paper Awards, the 2018 NSF CAREER Award, and the 2019 DoD DURIP Award. He serves on organizing committees for several conferences including IEEE HOST, ACM GLSVLSI, and IEEE ISCAS, and on technical program committees for DAC, ICCAD, MLCAD, and others. Dr. Savidis is a member of the VLSI Systems and Applications Technical Committee of the IEEE Circuits and Systems Society and serves on the editorial boards of IEEE Transactions on VLSI Systems, Microelectronics Journal, and ACM Transactions on Design Automation of Electronic Systems.

Hosted by Profs. Hossein Hashemi, Mike Chen and Constantine Sideris

Organized by Soumya Mahapatra (smahapat@usc.edu)

Sponsored by Ming Hsieh Institute