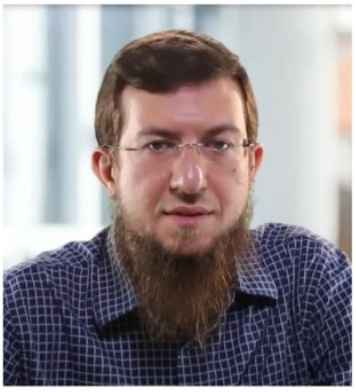
Dr. HESHAM ABDELSALAM OMRAN
Associate professor, Ain Shams University, Egypt



Short biography:

Dr. Hesham Omran received the B.Sc. (with honors) and M.Sc. degrees from Ain Shams University, Cairo, Egypt, in 2007 and 2010, respectively, and the Ph.D. degree from King Abdullah University of Science and Technology (KAUST), Saudi Arabia, in 2015, all in Electrical Engineering.
From 2008 to 2011, he was a Design Engineer with Si-Ware Systems (SWS), Cairo, Egypt, where he worked on the circuit and system design of the first miniaturized FT-IR MEMS spectrometer (NeoSpectra), and a Research and Teaching Assistant with the Integrated Circuits Lab (ICL), Ain Shams University. From 2011 to 2016 he was a Researcher with the Sensors Lab, KAUST. He held internships with Bosch Research and Technology Center, CA, USA, and with Mentor Graphics, Cairo, Egypt. In 2016, he rejoined the ICL, Ain Shams University, where he is currently an Associate Professor.
He created the Mastering Microelectronics YouTube channel, which specializes in microelectronics education for the Arab world and has over 18,000 subscribers. He co-founded Master Micro in 2020 to develop The Analog Designer's Toolbox (ADT), a novel EDA tool that is defining a new paradigm for analog IC design.
Dr. Hesham has received several awards, including the Egyptian State Encouragement Award for Engineering (2019), the Ain Shams University Encouragement Award for Technology (2021), the Design Automation Conference (DAC) Innovator's Award (2022), and the UNESCO AlFozan Award for Young Scientists in STEM (2023).
He has published over 50 papers in international journals and conferences. His research interests are in the design of analog and mixed-signal integrated circuits, with a special focus on analog and mixed-signal CAD tools and design automation.

Keynote title: Breaking the Bottleneck: Reimagining the Analog IC Design Flow.

Keynote abstract:

The exponential advancement of integrated circuit (IC) technology over the last half-century has transformed nearly every aspect of our lives. However, the analog IC design flow has remained largely unchanged since the introduction of Berkeley SPICE in the 1970s, creating significant challenges in designing complex systems and transferring analog design knowledge and expertise. To address this productivity bottleneck, a new design paradigm is needed, one that leverages advanced automation and computational techniques. This talk will present a new paradigm that integrates the gm/ID design methodology with a data-driven approach powered by precomputed lookup tables (LUTs) of device data. This automated flow empowers designers at the

device level by enabling transistor sizing based on performance metrics and visualization of design charts, and at the block level by facilitating interactive design space exploration, agile constraint management, design trade-offs visualization, and fast optimization. Ultimately, this modern design flow bridges the gap between theory and practice, demystifies analog design, boost productivity, restore designer intuition, and make the analog design process systematic, optimized, and enjoyable.