

SEMINAR ANNOUNCEMENT

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING
COLLEGE OF DESIGN AND ENGINEERING
Website: <https://cde.nus.edu.sg/ece>

Area: Integrated Circuits & Embedded Systems (ICES)

Host: Professor Massimo Alioto

Research Seminar

TOPIC	:	From RTL to Flexible Silicon: Digital Design and Standard-Cell Implementation in IGZO Plastic Electronics
SPEAKER	:	Dr. Marco Privitera
DATE	:	Tuesday, September 15, 2026
TIME	:	5:00 pm to 6:00 pm
VENUE	:	E1-06-01 SEMINAR ROOM

ABSTRACT

Amorphous indium-gallium-zinc-oxide (a-IGZO) thin-film transistor technologies are enabling a new class of lightweight, flexible, and potentially ultra-low-cost electronic systems. However, translating conventional digital design methodologies to flexible substrates requires reconsidering several assumptions normally taken for granted in CMOS technologies, including device performance, unipolar logic operation, interconnect parasitics, variability, and available routing resources.

This seminar presents a practical overview of digital integrated-circuit design in IGZO flexible technology, with particular emphasis on the development and characterization of digital standard cells and their integration into an automated RTL-to-GDS design flow. Starting from TFT device characteristics and technology constraints, the seminar will discuss logic-gate architectures, cell sizing, standard cells library, timing and power characterization, synthesis, placement and routing, timing closure, and physical verification. Examples of digital building blocks and complete systems implemented using this methodology will illustrate how conventional Cadence EDA tools can be adapted to emerging flexible technologies.

The seminar will conclude by discussing the main limitations of current digital IGZO platforms and the design techniques that can help bridge the performance and integration-density gap between flexible electronics and conventional silicon technologies.

BIOGRAPHY



Marco Privitera (Member, IEEE) was born in Italy in 1997. He received the M.Sc. degree (summa cum laude) and the Ph.D. degree in electronic engineering from the University of Catania, Italy in and 2021 and 2024, respectively, where is currently a research Fellow and co-teaching Basic of Electronics for bachelor's degree courses. In 2023-2024 he joined the Green-IC research group within the National University of Singapore (NUS), Singapore, as Visiting Ph.D. student and in 2025-2026 as visiting researcher. In 2023, he received the IEEE-CAS Pre-Doctoral Award and in 2025 Best PhD Thesis Award from SIE (Società Italiana di Elettronica). He is/was Technical Program Committee member of IEEE international conferences (e.g., DCIS, PRIME, ICECS, MCSoc). He co-authored more than 30 publications in international journals and conference proceedings. His current research interests include power management integrated circuits, data communication, ultra-low power and ultra-low voltage analog blocks for energy harvesting and flexible circuit design.