SMACD 2025
Istanbul-TURKIYE
"where circuits come alive"

KEYNOTE TALK

Speaker

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Dr. Irem Boybat is a Staff Research Scientist at IBM Research Europe, Zurich, Switzerland. She received her Ph.D. degree in Electrical Engineering from Ecole Polytechnique Federale de Lausanne (EPFL), Switzerland, in 2020. Previously, she had obtained an M.Sc. degree in Electrical Engineering from EPFL, Switzerland, in 2015, and a B.Sc. degree in Electronics Engineering from Sabanci University, Turkey, in 2013. Her research is primarily centered around analog in-memory computing for accelerating deep neural networks using non-volatile memory devices. She has co-authored over 50 scientific papers in journals and conferences, received four best conference presentation/paper/poster awards and holds 8 granted patents. She was a co-recipient of the 2018 IBM Pat Goldberg Memorial Best Paper Award and 2020 EPFL PhD Thesis Distinction in Electrical Engineering.

Analog In-Memory Computing for Deep Learning Acceleration

Deep neural networks (DNNs) have demonstrated remarkable potential in solving complex problems, though their deployment often demands substantial computational resources. This keynote explores the emerging paradigm of analog in-memory computing (AIMC) for DNN inference, moving beyond digital accelerators such as graphics processing units (GPUs) and tensor processing units (TPUs). AIMC blurs the line between memory and computation, offering the promise of improved energy efficiency. The keynote delves into various memory technologies for AIMC, examining how device characteristics influence accuracy and architecture. It also highlights heterogeneous architectures combining analog and digital processing units for DNN inference, alongside techniques to maintain accuracy for AIMC-based accelerators.