MIM WEBINARS

AN IN-MEMORY COMPUTING SERIES

Next Talk: 21/March/2022, 4-5:30pm CET

NEUROSIM: A BENCHMARK FRAMEWORK OF COMPUTE-IN-MEMORY HARDWARE ACCELERATORS FROM DEVICES/CIRCUITS TO ARCHITECTURES/ALGORITHMS

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Compute-in-memory (CIM) is a new paradigm for machine learning hardware acceleration. DNN+NeuroSim is an integrated framework to benchmark CIM accelerators for deep neural network (DNN), with hierarchical design options from device-level, to circuit-level and up to algorithm-level. NeuroSim is a C++ based circuit-level macro model, which can achieve fast early-stage pre-RTL design exploration (compared to a full SPICE simulation). It takes design parameters including memory types (includes SRAM, RRAM, PCM, MRAM and FeFET), non-ideal device parameters, transistor technology nodes (from 130 nm to 7nm), memory array size, training dataset and traces to estimate the area, latency, dynamic energy, leakage power. A python wrapper is developed to interface NeuroSim with deep learning platforms Pytorch, to support flexible network topologies including VGG, DenseNet and ResNet for CIFAR/ImageNet classification. It supports weight/activation/gradient/error quantization in algorithm, and takes non-ideal properties of synaptic devices and peripheral circuits, in order to estimate training/inference accuracy. The framework is open-sourced and publicly available on GitHub https://github.com/neurosim/ . NeuroSim's user community is growing. This talk aims for a broader education to the community, and help the researchers to use/modify the code more flexibly for their own research purposes. More information about the event and the speaker: https://www.ict.tuwien.ac.at/staff/taherinejad/MiM/next.html

Mondays in Memory (MIM) is a free biweekly webinar series open to everyone around the world and dedicated to all aspects and technologies related to in-memory computing (including, in a broader sense, near-memory computing too). MIM will be held on the first and third Monday of each month (starting in May 2021) at 4pm CET (7am Pacific time, and 10pm Beijing time).
Each webinar starts with a 40mins talk by a speaker, followed up with a 40mins questions and discussions with the speaker and two panel members. Dr. Nima Taherinejad hosts the webinars, and together with his team they organize the MiM series.

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Shimeng Yu is currently an associate professor of electrical and computer engineering at Georgia Institute of Technology. Prof. His research expertise is on the emerging non-volatile memories for applications such as deep learning accelerator, in-memory computing, 3D integration, and hardware security. Among Prof. Yu's honors, he was a recipient of NSF Faculty Early CAREER Award in 2016, IEEE Electron Devices Society (EDS) Early Career Award in 2017, ACM Special Interests Group on Design Automation (SIGDA) Outstanding New Faculty Award in 2018, Semiconductor Research Corporation (SRC) Young Faculty Award in 2019, ACM/IEEE Design Automation Conference (DAC) Under-40 Innovators Award in 2020, IEEE Circuits and Systems Society (CASS) Distinguished Lecturer for 2021-2022, and IEEE EDS Distinguished Lecturer for 2022-2023, etc. He is a senior member of the IEEE.