MIM WEBINARS MIM

AN IN-MEMORY COMPUTING SERIES

Next Talk: 21/June/2021, 4-5:30pm CET

DEEP LEARNING ACCELERATION: A KILLER APPLICATIONFOR IN-MEMORY COMPUTING?

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The rise of AI and in particular, deep learning (DL), is a key driver for innovations in computing systems. There is a significant effort towards the design of custom ASICs based on reduced precision arithmetic and highly optimized dataflow. However, the need to shuttle millions of synaptic weight values between the memory and processing units, remains unaddressed. In-memory computing (IMC) is an emerging computing paradigm that addresses this challenge of processor-memory dichotomy. Attributes such as synaptic efficacy and plasticity can be implemented in place by exploiting the physical attributes of memory devices such as phase-change memory (PCM). In this talk, I will give a status update on where in-memory computing stands with respect to DL acceleration. How do we tackle imprecision arising from noisy, analog computing? I will present some recent algorithmic as well as device-level innovations. I will also touch upon some system-level aspects and will present a world's first IMC compute core based on PCM fabricated in 14nm CMOS technology. Finally, I will provide a brief overview of photonic in-memory computing that could facilitate unprecedented latency and compute density.

More information about the event and the speaker:

https://www.ict.tuwien.ac.at/staff/taherinejad/MiM/next.html

Abu Sebastian is a Distinguished Research Staff Member at IBM Research – Zurich. He was a contributor to several key projects in the space of storage and memory technologies and currently leads the research effort on in-memory computing at IBM Zurich. Dr. Sebastian is a co-recipient of the 2009 IEEE Control Systems Technology Award and the 2009 IEEE Transactions on Control Systems Technology Outstanding Paper Award. In 2015 he was awarded the European Research Council (ERC) consolidator grant and in 2020, he was awarded an ERC Proof-of-concept grant. He is an IBM Master Inventor since 2016. He was named Principal and Distinguished Research Staff Member in 2018 and 2020, respectively. In 2019,he received the Ovshinsky Lectureship Award for his contributions to "Phase-change materials for cognitive computing".