MIM WEBINARS

AN IN-MEMORY COMPUTING SERIES

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

IN-MEMORY COMPUTING WITH ASSOCIATIVE MEMORIES — A CROSS-LAYER PERSPECTIVE

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Data transfer between processors and memory is a major bottleneck in improving application-level performance. This is particularly true for data intensive tasks such as many machine learning and security applications. In-memory computing, where certain data processing is performed directly in the memory array, can be an effective solution to address this bottleneck. Associative memory (AM), a type of memory that can efficiently "associate" an input query with appropriate data words/locations in the memory, is a powerful in-memory computing core. Nonetheless harnessing the benefits of AM requires cross-layer efforts spanning from devices and circuits to architectures and systems. In this talk, I will showcase representative cross-layer AM based design efforts. In particular, I will highlight how different non-volatile memory technologies (such as RRAM, FeFET memory and Flash) can be exploited to implement various AM functions (e.g., exact and approximate match, ternary and multi-bit data representation, and different distance functions). I will use several popular machine learning and other applications to demonstrate how they can profit from these different AM designs. End-to-end (from device to application) evaluations will be analyzed to reveal the benefits contributed by each design layer, which can serve as guides for future research efforts. 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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X. Sharon Hu is a professor in the department of Computer Science and Engineering at the University of Notre Dame, USA. Her research interests include low-power system design, circuit and architecture design with emerging technologies, real-time embedded systems and hardware-software co-design. Some of her recognitions include the Best Paper Award from the Design Automation Conference and from the International Symposium on Low Power Electronics and Design, and NSF Career award. She is the Editor-in-Chief of ACM Transactions on Design Automation of Electronic Systems, and has also served as Associate Editor for a number of ACM and IEEE journals. X. Sharon Hu is a Fellow of the ACM and a Fellow of the IEEE.

For more information, please see his webpages at https://sites.nd.edu/xsharon-hu/