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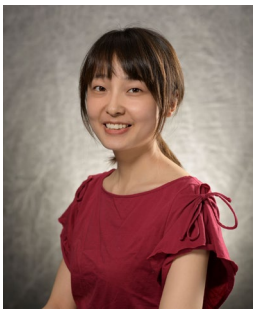
Electrical and Computer Engineering Seminar



Cong "Callie" Hao

Assistant Professor, Georgia Tech

Wednesday, October 16, 2024
1:30 P.M. – 2:30 P.M.
MSEE 112

Agile Hardware Development: Architecture and Tools

Abstract
Agile hardware development has two most important aspects: high-performance domain-specific architectures, and the design automation tools that facilitate the rapid development of such architectures. In this talk, we will discuss both aspects. First, we introduce two open-source domain-specific architectures: one for graph neural network (FlowGNN), the other for mixture-of-expert vision transformer (Edge-MoE). Next, we introduce our open-source agile development tool, LightningSim (best paper runner-up @ FCCM'23), built on top of Vitis HLS (high-level synthesis), which significantly speeds up the C/RTL co-simulation for accurate performance. Third, we introduce our on-FPGA profiling tool, RealProbe, which provides detailed, on-board performance profiling using HLS. Finally, we briefly introduce our open-source infrastructure for HLS dataset and benchmark collection and generation, HLSFactory (best paper @ MLCAD'24).

Bio
Dr. Cong (Callie) Hao is an assistant professor in ECE at Georgia Tech. She was a postdoctoral fellow at Georgia Tech from 2020-2021 and at UIUC from 2018-2020. She received the Ph.D. degree in Electrical Engineering from Waseda University in 2017, and the M.S. and B.S. degrees in Computer Science and Engineering from Shanghai Jiao Tong University. Her primary research interests lie in the joint area of efficient hardware design and machine learning algorithms, including software/hardware co-design for reconfigurable and high-efficiency computing and agile electronic design automation tools.

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