

Seminar Announcement

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Columbia University, New York City, NY, USA

Open-Source Hardware for Heterogeneous Computing

Wednesday, June 29, 2022, 2:30 pm

Aula 2T
Politecnico di Torino

Abstract

Information technology has entered the age of heterogeneous computing. Across a variety of application domains, computer systems rely on highly heterogeneous architectures that combine multiple general-purpose processors with many specialized hardware accelerators. The complexity of these systems, however, threatens to widen the gap between the capabilities provided by semiconductor technologies and the productivity of computer engineers. Open-source hardware is a promising avenue to address this challenge by enabling design reuse and collaboration. ESP is an open-source research platform for system-on-chip design that combines a scalable tile-based architecture and a flexible system-level design methodology. With ESP, designers can rapidly prototype an SoC architecture with multiple RISC-V processor cores and dozens of loosely-coupled accelerators, all interconnected with a multiplane network-on-chip. The ESP methodology promotes system-level design while accommodating different specification languages and design flows. Conceived as a heterogeneous system integration platform, ESP is intrinsically suited to foster collaborative engineering across the open-source hardware community.

Short Bio: Luca Carloni is professor and chair of Computer Science at Columbia University in the City of New York. He holds a Laurea Degree Summa cum Laude in Electronics Engineering from the University of Bologna, Italy, and the MS and PhD degrees in Electrical Engineering and Computer Sciences from the University of California, Berkeley. His research interests include heterogeneous computing, system-on-chip platforms, embedded systems, and open-source hardware. He coauthored over one hundred and seventy refereed papers. Luca received the NSF CAREER Award, the Alfred P. Sloan Research Fellowship, and the ONR Young Investigator Award. He is an IEEE Fellow.

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