Speaker:
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Title:
Reconfigurable systems in next-generation, heterogeneous HPC platforms: The SOpenCL case.

Abstract:
As many-core and reconfigurable architectures are predicted to enter the mainstream of high performance, desktop, and embedded computing, there is a pressing demand for high-level programming paradigms that can effectively map algorithms to heterogeneous parallel architectures without requiring heroic efforts on the part of the programmer. To that effect, there has been a recent push by industry and academia to provide programming models that alleviate the burden of having to re-think, re-code and re-deploy applications for each new platform architecture released from chip vendors. OpenCL is an industry-supported
programming model that promises to let programmers write a single portable program that can be deployed to all heterogeneous platforms available today (and hopefully future ones).

In this talk, we discuss Silicon OpenCL (SOpenCL), a novel tool and methodology which utilizes OpenCL as a programming model to generate hardware accelerators for System On Chip platforms. SOpenCL is based on the observation that contemporary reconfigurable fabrics bear a strong resemblance to many-core systems, because they lay out computation not only in time, but also in space. An important aspect of SOpenCL is that it enables the large pool of software and algorithm IP developers to quickly prototype and productize platforms even if they do not have access to hardware expertise.

We will present our recent and exciting experiences in using SOpenCL to produce hardware for a series of realistic multimedia and communication benchmarks. Finally, we give our perspective on how SOpenCL compiler and run-time system can be used as a generalized programming model for applications to be written without any prior knowledge of the target platform.