

Leonel Sousa

Technical University of Lisbon, Portugal

Title: ***Monitoring Performance and Power for Application Characterization with Cache-aware Roofline Model***

Abstract:

Accurate on-the-fly characterization of application behavior requires assessing a set of execution-related parameters at runtime. These parameters do not only refer to performance, but also to power and energy consumption, which can be obtained by relying on built-in hardware measurement facilities in modern multi-core architectures, such as performance and energy counters. However, current OSs do not provide the means to directly obtain this characterization data, and the user still needs to rely on complex custom-built libraries with limited capabilities, which might introduce significant execution and measurement overheads. In this keynote, two different techniques are proposed for efficient performance, power and energy monitoring of multi-core systems. The proposed monitoring facilities allow capturing the run-time behavior of a wide range of applications at two different system levels, i.e., one facility at the user-space level and the other which is directly integrated into the OS kernel, thus examining the real application execution from completely different aspects. Although the importance of the proposed monitoring facilities is patent for many purposes, this presentation is focused on their employment for application characterization by relying on the recently proposed Cache-aware Roofline model.