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# Is your scheduling good? How would you know?

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## Abstract

Optimal scheduling is a goal that can rarely be achieved, even in purely theoretical contexts where the nuanced behavior of complex hardware and software systems can be abstracted away, and simplified assumptions can be made.

In real runtime systems, task schedulers are usually designed based on intuitions about optimal design and heuristics such as minimizing idle time and load imbalance, as well as maximizing data locality and reuse.

This harsh reality is due in part to the very crude tools designers of task scheduling systems have at their disposal for assessing the quality of their assumptions.

Examining hardware behavior-such as cache reuse-through counters rarely leads to improvement in scheduler design, and quite often the runtime designers are left with total execution time as their only guiding mechanism.

In this talk we will discuss new methods for illuminating the dark corners of task scheduling on real hardware.

We will present our work on extending PAPI-which has long been the de facto standard for accessing hardware events-so that it can be used to access software events.

We will focus specifically on the impact this work can have on runtime systems with dynamic schedulers, and discuss illustrative examples.

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