ETH
Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich

TIK
Technische Informatik und Kommunikationsnetze
Computer Engineering and Networks

Prof. L. Thiele

Semester:

Designing Benchmarks for High Performance Systems

Motivation and Informal Description: In our laboratory, we are constantly searching for techniques to extract ever more computational power from the available processors. Although we have some of the smartest algorithms to do so, a single processor these days is not capable of fulfilling our computational demands: any faster will require invention of new materials, and related principles. Multiprocessor machines circumvent the performance ceiling of uni-core machines. For this reason, modern smart-phones, tablets, notebooks and desktops feature multicore processors. At our laboratory, we are looking to develop new algorithms to extract maximum performance from the state-of-the-art multiprocessors. In fact, we go one step further: we are working on techniques that use many physically separate machines to achieve unparalleled performance.

We need you!

We are looking for smart young people to help us develop and compare algorithms, that stress multicore processors, running on many physically separate machines. If you decide to join us, you thesis will be to develop benchmarks, such as a motion JPEG decoder (see figure), that our laboratory will use in measuring the performance of our algorithms on these state-of-the-art machines.

What do you get?

You will be exposed to some cutting-edge research, which will become mainstream technology in the days to come.

A Motion JPEG Decoder Mapped to three different physical machines

You will get a chance to learn a lot about programming multiprocessor computers, using brand new technologies such as C++/11, OpenMPI and POSIX threads. We will teach you not only how to develop distributed programs, but will also teach you how to efficiently debug and validate these programs. You will get a working example to start with, and you will be expected to develop mutually agreed benchmarks for our laboratory. You will be exposed to some of the most modern hardware, such as the Intel Single Chip Cloud Computer (SCC) for your work.

Requirements

C/C++, Java/Perl

Interested? Please have a look at http://www.tec.ethz.ch/research.html **and contact us for more details!**

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