

Scientific Computing

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CBC Seminar on Computer Architecture - September 10-11, 2013

The speaker is Prof. Chunyuan Zhang, who is a key member of the researcher team that built Tianhe-2 at National University of Defense Technology, China. Tianhe-2 is the most powerful supercomputer in the world today.

Total number of participants: 26

Total number of guests outside of CBC: 16

Number of different nationalities represented: 8

Total number of speakers: 2

Total number of talks: 4

Short Course on Computer Architecture

Session 1: Tuesday September 10, 9:15-12:00

Seminarrom Caml (No.3438), Ole-Johan Dahls hus, Ifi, UiO
Prof. Chunyuan Zhang, NUDT, China

Conventional processor architecture: *Introduction*

How do we learn and think about computer architecture? This field is rapidly changing and must be studied with real examples. We will focus on core concepts that can be found in any modern processor.

Pipelining

is an implementation technique where multiple instructions are overlapped in execution; it takes advantage of parallelism that exists among the actions needed to execute an instruction. Pipelining is the key implementation technique used to make fast CPUs. We will start with the basics of pipelining, and continue with discussing data path implications, introducing hazards, and examining the performance of pipelines.

Session 2: Tuesday September 10, 14:15-17:00

Datastue Chill (No.3443), Ole-Johan Dahls hus, Ifi, UiO
Dr. Ju Ren, NUDT, China
Hands-on exercise on pipelining

Session 3: Wednesday September 11, 9:15-12:00

Seminarrom C (No.3437), Ole-Johan Dahls hus, Ifi, UiO
Prof. Chunyuan Zhang, NUDT, China
More about conventional processor architecture: *Scoreboarding*

In this part, we will explore an important technique, called dynamic scheduling, in which the hardware rearranges the instructions execution to reduce stalls. We will give a simpler introduction to dynamic scheduling by explaining the scoreboarding technique, a method for scheduling a pipeline in CDC6600.



Stream Processing

Today, a GPU consists of thousands of streaming processors. What is the difference between a conventional computer processor and a streaming processor? We will show how a streaming processor architecture is ideally suited for applying wire-limited semiconductor technology to compute intensive applications.

Session 4: Wednesday September 11, 14:15-16:00

Seminarrom Sed (No.1454), Ole-Johan Dahls hus, Ifi, UiO
Prof. Chunyuan Zhang and Dr. Jun Ren, NUDT, China
Questions and answers

What	
When	Sep 10, 2013 09:15 AM to Sep 11, 2013 04:00 PM
Where	Ole-Johan Dahls hus, IFI, UiO

Contact Name	Xing Cai
	Alex Oltu
	Chunyuan Zhang
	Dag S. Nærland
	Dan Jansson
	Ernst Gunnar Gran
	Glenn Lines
	Heidi C. Bernhoff-Jacobsen
	Henrik R. Nagel
	Ida Drøsdal
	Jens Eftang
	Jo Inge Bitabekk
	Johan Hake
Attendees	Johannes Langguth
	Ju Ren
	Jun Chai
	Mariolena Demetrio
	Mohammad Sourouri
	Ole W. Saastad
	Pål Halvorsen
	Sigmund Hansen
	Simen Gure
	Tor Skeie
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	Wei Zhang
	Xing Cai
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