CS-728  
Topics on Datacenter Design

Falsafi Babak, Kermarrec Anne-Marie

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<th>Cursus</th>
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Language of teaching: English  
Credits: 2  
Session:  
Exam: Oral  
Workload: 60h  
Hours: 28  
Lecture: 14  
Practical work: 14  
Number of positions:  

Remark
Spring 2024 to be confirmed

Summary
Modern datacenters with thousands of servers and multi-megawatt power budgets form the backbone of our digital universe. In this course, we will survey a broad and comprehensive spectrum of datacenter design topics from workloads, to server architecture and infrastructure.

Content
The course will use the primer from ClayPool lecture series on Warehouse-Scale Computing by Barroso and Hoelzle, and technical research papers from recent years in venues corresponding to the topic. The course will be run as a seminar series with student presentations followed by an in-class discussion. The students will be graded based on presentations and short reviews written for each reading assignment.

- Datacenter basics: computing at scale of tens of thousands of servers  
- Quality of service, energy proportionality and total cost of ownership  
- Workloads  
- Programming paradigms  
- System software  
- Virtualization  
- Networking  
- Storage systems  
- Processors and memory systems  
- Resource management  
- Infrastructure: power distribution and cooling