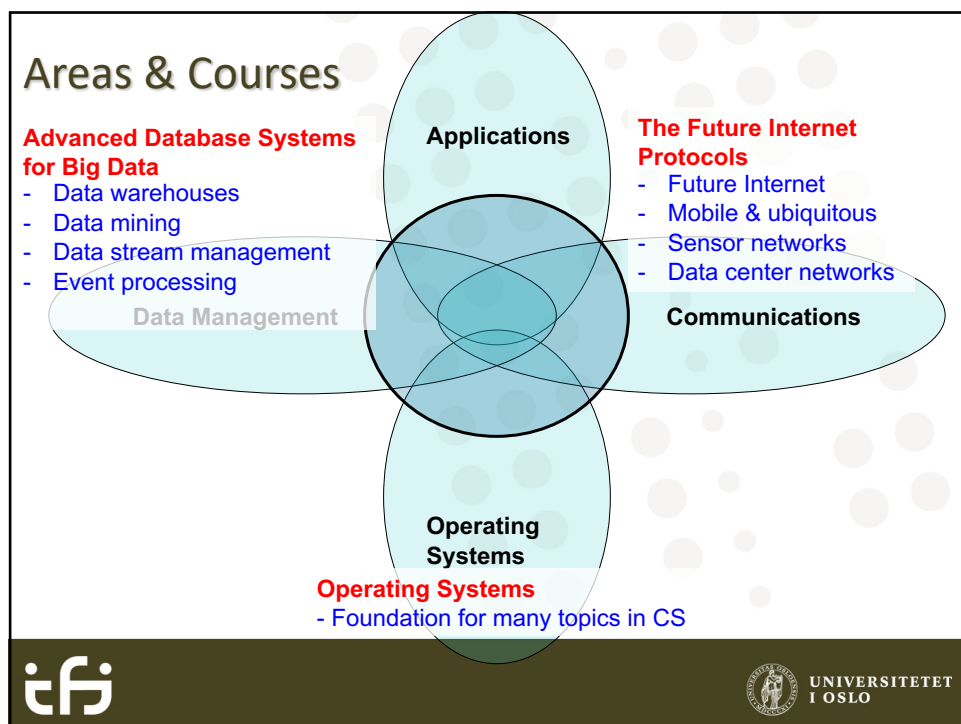
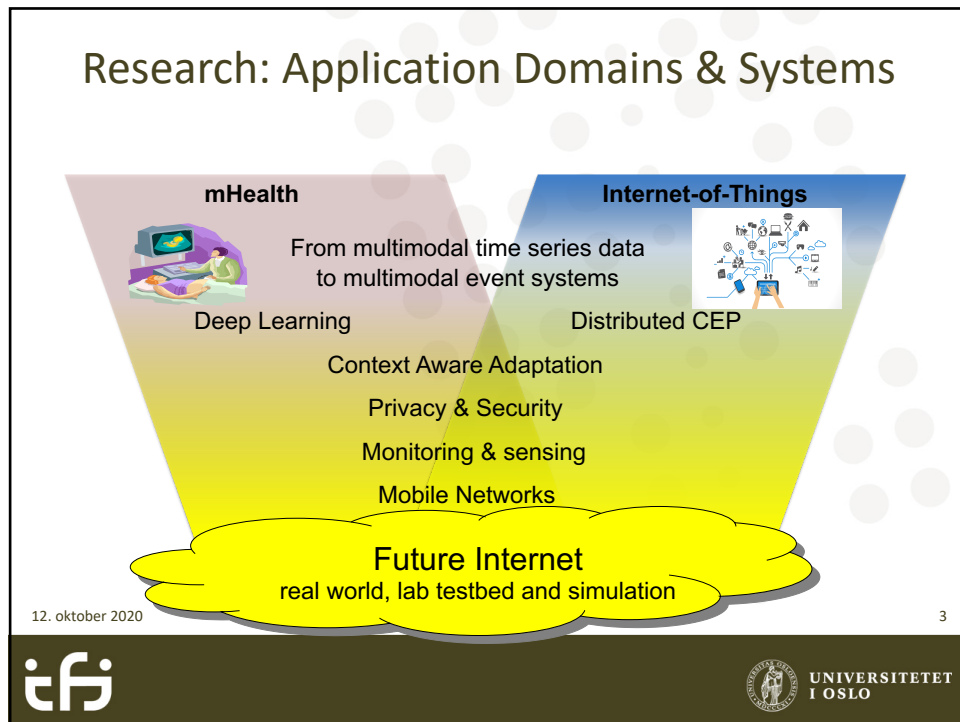




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Operating Systems (Spring Term)

INF 3151/4151 (old codes)

Thomas Plagemann, Vera Goebel,
Otto Anshus, Knut Omang

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Learning by doing



- Guided process to **build your OS**
 - First design! You propose, we give you feedback!
 - Afterwards implementation
 - In total six projects
 - P1: Bootup
 - P2: Non-preemptive kernel
 - P3: Preemptive kernel
 - P4: Interprocess communication and driver
 - P5: Virtual memory
 - P6: File system
- Grading based on your presentation
 - Design (one week)
 - Code (two weeks)



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Some of What You Will Learn

- Operating System Structure
 - structures, processes, threads, and system calls
- Synchronization
 - mutex, semaphores, monitors
- Processor
 - time slices, scheduling
- Virtual memory
 - address spaces, demand paging
- I/O subsystems
 - device drivers, inter process and inter thread communication,
- Networking
- Storage systems
 - disks and file systems

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Organization of the Course

- Course mode:
 - Lectures (**last Spring term!**):
 - Wednesday, 14:15-17:00, Lille Aud. (old Ifi)
 - Thursday, 14:15-17:00, Lille Aud. (old Ifi)
 - Group teaching:
 - Project specific
 - Two times 2 hours
- Grading:
 - 8 mandatory deliverables (must pass all)
 - 4 graded deliverables (P2b, P3b, P4b, P5b) each counts 25% for the final grade
- **Due to resource constraints only a limited number students can take the course**

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“There are no gains without pains.”

Benjamin Franklin

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Course Purpose

- The course gives an overview of new developments within data management technology
 - Emphasis on usage and applicability
 - Concepts and design, not so much about concrete systems
- Required pre-knowledge: standard DBS (relational and object-relational DBS)

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Overview

- Data Stream Management Systems
- Complex Event Processing
- Distributed Database Systems
- Heterogeneous Database Systems
- Data Warehouses
- Data Mining and XML Databases
- Big Data, NoSQL DBS
- Cloud Data Management
- Performance Analysis and Large Scale DBS

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Organization of the Course

- Course mode:
 - Lectures: Tuesdays, 3 hours, 14:15-17:00, Lille Aud (old Ifi)
 - First lecture: 27. August 2016
 - 10 weeks lecturing
- Examination:
 - Oral (or Written)
 - Date to be announced later

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What are we teaching?

Future Internet

Evolutionary:

- Multicast and CacheCast
- Streaming through firewalls and NATS
- Mobile Ad-Hoc Networks
- Network Virtualization

Revolutionary:

- Basic principles
- Delay tolerant networking
- Autonomic Networking in ANA
- Sensor networks
- Data center networks
- Software Defined Networks

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Organization of the Course

- Course mode:
 - Lectures:
 - Wednesday, 2-3 hours, 14:15-17:00, Logo
 - Lecture schedule will be online soon and might change a bit
- Grading:
 - Oral or written examination

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Master Thesis at DMMS

- Learn to perform research and development and finish successfully your project
- Research topics with high relevance for the real world
- Integration in our research team → tight collaboration
- High ambitions → many theses have resulted in publications
- Student jobs in the projects available
- International exchanges possible
- Possibility to follow-up with a PhD

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Taking a DMMS Master Project

- Many people working on similar/related topics
- We are interested in real systems for the future
 - Wearable computer, sensors, Planet-Lab,
- Our work is mainly of experimental nature and very close to (or part of) ongoing research
- Goal: each master thesis should lead to a publication
- Typical thesis work
 - Read literature, gather information/knowledge about the “problem area”
 - Analyze/test/benchmark existing solutions
 - Design and implement a new/better solution
 - Analyze, test, compare, and evaluate



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What if you are interested....

- Get in touch with us, e.g., email to plageman@ifi.uio.no
- We schedule a meeting to align your and our interest
- We look at your study plan
- We formulate the goal and approach of your thesis together with you.....

..... and off you go ;)

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CESAR: Using Complex Event Processing for Low-threshold and Non-intrusive Sleep Apnea Monitoring at Home

- Enable sleep monitoring at home before diagnosis using smart-phones and off-the-shelf sensors
- Automatic data analysis off-line (data mining) and on-line (Complex Event Processing)

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Typical Components of a Cesar Thesis

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Typical Components of a Cesar Thesis


- Data acquisition:
 - Smart watches, sensors, ++
 - App on Android
- Data quality:
 - Placement & quality
 - Quality improvement
- ML
- Experiments:
 - In lab
 - During sleep at home

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Towards accurate simulation of Distributed CEP

- High-performance Distributed CEP
- Wireless (multi-hop) networks
- Mobile sources, brokers, sinks
- Software defined networks






NS3 RESEARCH WORK

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Real-time Data Analysis in the Internet of Things with Privacy Protection



- Trustworthy device communities
- Distributed CEP
- Privacy Quantification
- mHealth applications

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Potential Thesis Topics

- IoT applications with different privacy requirements
- Implementing privacy protecting mechanisms in CEP systems
- CEP query rewriting to insert privacy protection

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