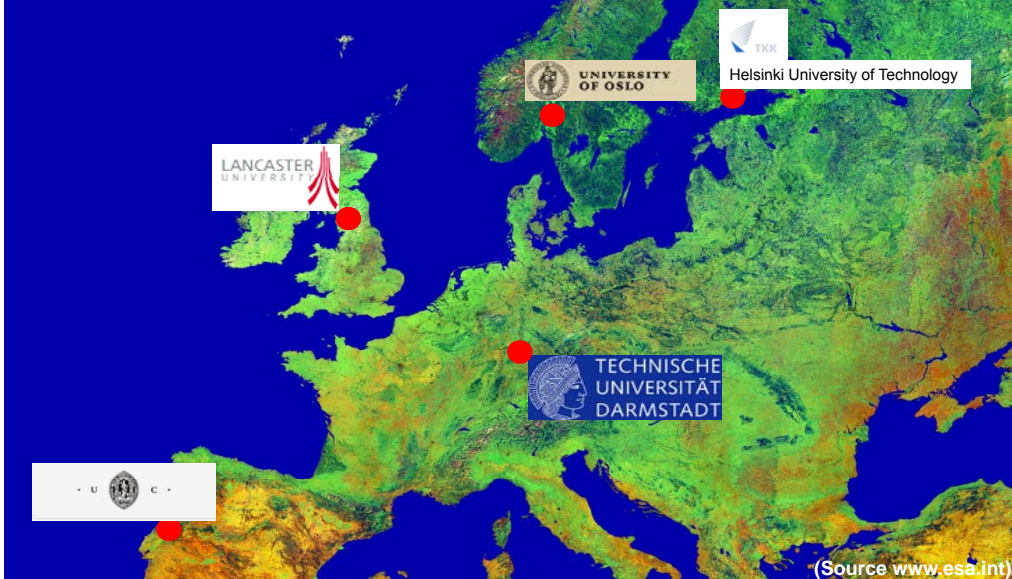


# INF 5090: Advanced Topics in Distributed Systems

– a distributed, international graduate course –



## Outline

- Background
- Basic idea and approach
- Content of the course
- Time schedule
- Lab assignments
- Collaboration
- Tools
- Credits, marks, and grading
- Benefits



## Basic Idea and Goals

- Provide a framework for intensive European collaboration in graduate-level courses/seminars
- Provide high quality lectures from internationally recognized lecturers
- Let students from different European Universities work together in one team to solve concrete assignments
- Enable personal contacts between lecturers, students, and teaching assistants (TAs)
- All institutions should benefit in teaching and research from this course/seminar
- Keep administrative overhead acceptable
- Keep traveling costs (monetary and time) low

## Basic Approach

- Hosting lectures from the other Institutions:
  - Sasu Tarkoma & Matti Siekkinen (HUT), Marilla Curado (U Coimbra), Andreas Mauthe (Lancaster U), and Knut Omang (Paradial) will give a lecture in Oslo for INF5090 (Spring 2009)
  - plus introduction into group work, introduction into tools, ++
- Each lecture will be recorded, stored and shipped to the other institutions
  - synchronized video, audio, and interaction with powerpoint, ++
  - lectures are made available on a server
  - we provide a supervised playback
- Provide access to lectures from the last years (INF5090 since 2005) that are not part of this years "pensum"

# Timing Constraints for the Course



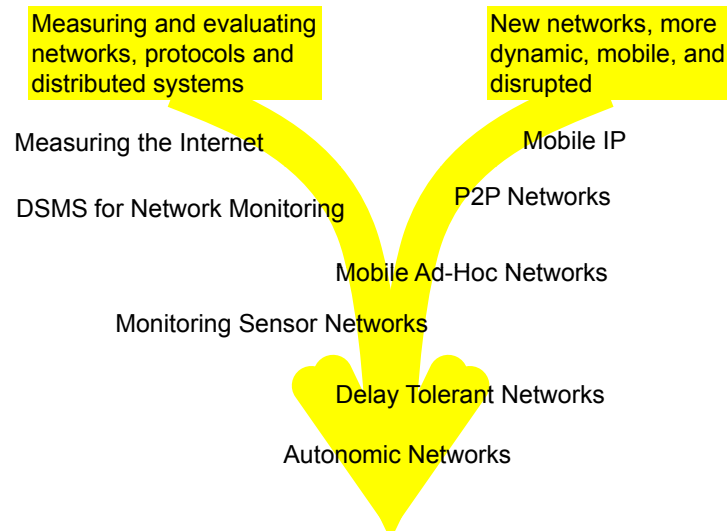
- Original idea:
  - Students from 2-3 institutions should work together
  - start and end of lab work must be synchronized
- Lectures are recorded
  - lectures must not be synchronized
- Reminder: a lecture from a recording can only be presented AFTER it has been recorded
- Identify those lectures that are necessary before the lab work starts

# Who is Teaching this Course?

- Lancaster University (England):  
Dr. J. Finney, Dr. A. Mauthe
- University of Coimbra (Portugal):  
Prof. F. Boavido, Prof. E. Monteiro
- TU Darmstadt (Germany): T. Krop, Dr. M. Hollick,  
Prof. R. Steinmetz
- University of Oslo (Norway):  
Dr. O. Drugan, Prof. V. Goebel,  
Prof. T. Plagemann
- Helsinki University of Technology (Finland):  
Dr. M. Siekkinen, Prof. S. Tarkoma



# What are we teaching?



■ = live lecture      ■ = date might change

# Preliminary Lecture Plan for Oslo

Date	Lecturer	Topic
21. 1.	Thomas Plagemann	Introduction into the course
28. 1.	Joe Finney	Mobile IP
4. 2.	Thomas Plagemann, Katrine S. Skjelsvik	Delay Tolerant Networking
11. 2.	Sasu Tarkoma	Publish/Subscribe Internetworking
18. 2.	Matthias Hollick	Ad-hoc Networks 1
25. 2.	Matthias Hollick	Ad-hoc Networks 2
4. 3.	Ovidiu Drugan	MANET clustering
11. 3.	Marillia Curado	QoS Routing
18. 3.	Vera Goebel	DSMS for Network Monitoring
25. 3.	Andreas Mauthe	Autonomic Networking
1. 4.	Vera Goebel, Jarle Søberg	DSMS for Sensor Networks & Event Processing
8. 4.	no lecture (Easter week)	
15. 4.	Knut Omang	Realtime Multimedia in presence of firewalls and network address translation (?)
22. 4.	Matti Siekkinen	Network Monitoring

## Lab Assignments

- A team of 3-4 students works on one assignment
  - international teams and local teams
- Time frame for lab assignments probably: 18.3. – 6.5.2009
  - OBS: Dates are not yet finalized!
- The deliverables:
  - Paper with design, implementation, and results (max 10 pages IEEE format)
  - Code, traces, etc. Documented!
- **Important:** you have to learn and practise collaboration!  
→ tools



## Lab Assignments

- Lab assignments are related to the lectures
- Each institution defines assignments that are of their strong interest
- From each institution the TA will be responsible for supervising/shepherding the groups that work on their assignments
- Preliminaries before the real group work starts:
  - Light-weight introduction into project management and team work
  - Introduction into the available collaboration tools
  - Introduction into software that should be used for the particular tasks

## Lab Assignments (cont.)

- Examples from last years lab assignments:
  1. Connectivity prediction in MANETs (Ovidiu Drugan – UiO)
  2. Clustering on OLSR topology (Ovidiu Drugan – UiO)
  3. Tools for creating mobility traces (Ovidiu Drugan – UiO)
  4. Sensor Networks & DSMS (Jarle Sørberg, Ovidiu Drugan – UiO)
  5. Weather Sensors and DSMS (Jarle Sørberg, Ovidiu Drugan – UiO)
  6. Mica2 motes and Nokia 770 (Jarle Sørberg, Ovidiu Drugan – UiO)
  7. Data Ferry to connect MANET partitions (Matija Puzar, Ovidiu Drugan – UiO)
  8. RoboCupRescue with communication over JiST/Mob (Tronje Krop, Ovidiu Drugan – TUD, UiO)
  9. Timing issues in monitoring (Tronje Krop – TUD)
  10. Overlay models of Gnutella, Skype, and Kazaa in PeerFact (Aleksandra Kovacevic, Tronje Krop – TUD)
  11. Mobile IP (Joe Finney – LU)
  12. Autonomic Computation (Andreas Mauthe – LU)

## Lab Assignments (cont.)

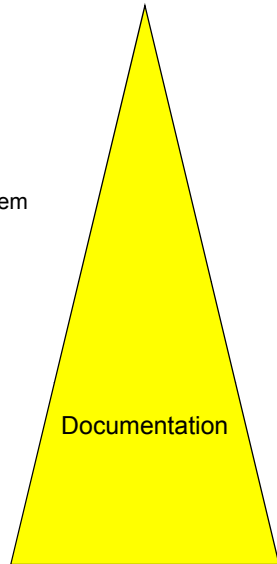
- Algorithm for assigning assignments:
  - List of all assignments will be published latest February 18th
  - Students have to consider two aspects:
    1. International or local group
    2. Interest in the different topics
  - There will be a list in which all students insert their preferences
  - We try to match as good as possible the indicated preferences
  - The group assignments will be published latest March 12th
  - Start working immediately after start date ...

## Collaboration

- Tools:
  - Lecturnity
  - CLIX
- Take up immediately contact with your team
- Which communication channels you want to use
  - White board
  - Chat room
  - E-mail
  - Netmeeting
  - Instant messenger
  - .....
- When do you want to communicate
  - Regular schedules help, e.g., meet in a chat room every Tuesday and Thursday at 14:00

## Collaboration (cont.)

- Preparation:
  - Reading background information
  - Analyze the problem
  - Get familiar with the programming environment and tools
- Design:
  - Brainstorm and develop different ideas for solving the problem
  - Describe their design
  - Discuss and compare their pros & cons
  - Select one (or more)
- Implementation:
  - Split up the implementation task
  - Identify core data structures and interfaces
  - Take care of versioning
- Evaluation:
  - Discuss what should be evaluated, why, and how
  - Analyze the results
  - How to best present the results



## Collaboration (cont.)

- Who is doing what when?
  - Team: Make a rough time plan (e.g., start with the tasks on the previous page)
  - Each member: Identify the times you can (and cannot) spend time for the assignment
  - Each member: Select those tasks you would like to do and which match your personal schedule
  - Team: Take care that there is for all tasks at least one responsible (OBS: preparation cannot be entirely partitioned)
  - Team: Compare each week current achievements vs. time plan, estimate the impact of delays, adjust effort and task distribution, update the time plan
- In the last section of the paper each team must identify who has contributed to what!

## Tools: Lecturnity

- <http://www.im-c.de/lecturnity/english/index.htm>
- Demo

## Tools: CLIX

- <http://clix.tu-darmstadt.de>
- Demo
- Everybody gets an account next week

## Marks and Grading

- The following marks are used:
  - Oslo: A,B,C,D, .. E, F
    - A – E is passed
    - F is failed
  - Darmstadt: 1,2,3,4, .. 5
    - 1-4 is passed
    - 5 is failed
  - Lancaster:
    - percentage for each course, more than 50% passed
    - More than 70% overall distinction (2 per year)
  - Helsinki: ...
    - ...
  - Coimbra: ....
    - ....

## Marks and Grading (cont.)

- How to perform grading in Oslo (Ifi/UiO):
  - Final mark is based on two parts:
    - 50% weight for oral examination of the theoretical part, i.e., the lectures
    - 50% weight for lab assignment, including presentation(s) and report
- How to agree on a mark for international groups:
  - for each lab assignment there is one responsible TA
  - TA identifies how much % has been solved
  - the % is mapped to the local marking system
- **Important: marks and grading are compliant to the local rules!**

## Benefits for Students

- Research oriented course that takes up important and very recent topics
- Lectured by recognized international experts in the field
- Getting personal contact to lecturers from which students normally would only read papers and books
- Learning about project management and team work in an international team
- Can get an idea what international research could be (for later decision whether to join a PhD programme)

## Benefits for the TAs

- TAs will typically be PhD students
- Intensive contact to the TAs at the other locations, which should also have a positive impact on the PhD student's research work (since they work more or less in the same domain)
- Potential preparation for a stay abroad or exchange of PhD students
- Personal contact to the lecturers from the other locations, discussion of their research work with them

## Benefits for the Lecturers

- Teaching highly important and very recent topics that are close to the own research activities
- Sharing the load of preparing lectures, which gives more time to keep the lecture always up to date
- Tight collaboration with the other institutions for teaching and research
- Good students in this course might be good candidates for later PhD research work
- Result of the evaluation should be disseminated
- Data of use of tools can be used for research