

INF 5090: Advanced Topics in Distributed Systems

– a distributed, international graduate course –



(Source www.esa.int)

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:
 - Qin (Christine) Lv (Stony Brook), Otto Anshus (University of Tromsø)
 - Matthias Hollick (TU Darmstadt), and Fernando Boavido (Coimbra University) will give a lecture in Oslo
 - 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 last year that are not part of this years "pensum"

Timing Constraints for the Course

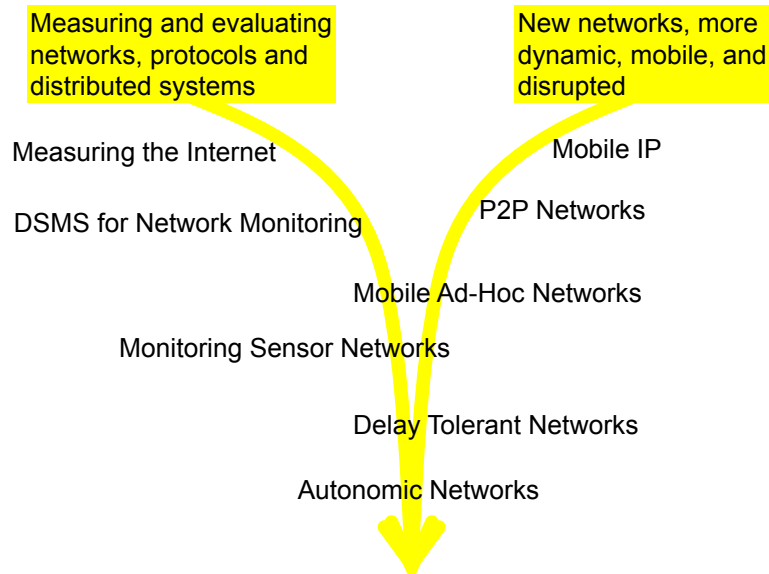
- Original idea:
 - Students from three institutions should work together
 - start and end of lab work must be synchronized
- Lectures are recorded
 - lectures must not be synchronized
- Reminder: a lecture from a recording can only be presented AFTER it has been recorded
- Identify those lectures that 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. M. Siekkinen, O. Drugan, Prof. V. Goebel,
Prof. T. Plagemann



What are we teaching?



■ = live lecture ■ = date might change

Preliminary Lecture Plan for Oslo

Date	Lecturer	Topic
23. 1.	Ovidiu Drugan Qin Lv	Introduction into the course Similarity Search for Large-Scale Feature-Rich Data
30. 1.	Joe Finney	Mobile IP and beyond
6. 2.	Vera Goebel	DSMS for Network Monitoring
13. 2.	Vera Goebel	Monitoring Sensor Networks & DSMS
20. 2.	Matti Siekkinen	Measuring the Internet – Part 1
27. 2.	Matti Siekkinen	Measuring the Internet – Part 2
5. 3.	Mathias Hollick	Mobile Ad-hoc Networking 1
12. 3.	Mathias Hollick	Mobile Ad-hoc Networking 2
19. 3.	no lecture	
26. 3.	Thomas Plagemann	Message passing & event notification
16. 4.	Fernando Boavida	Content distribution technologies for remote locations
23. 4.	Andreas Mauthe	Autonomic Networking
30. 4.	Otto Anshus	Worms and BotNets

Lab Assignments

- A team of four students works on one assignment
 - international teams and local teams
- Time frame for lab assignments probably: 25. 3. – 6. 5.
 - OBS: we do a final check quick!
- 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/sheperding 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.)

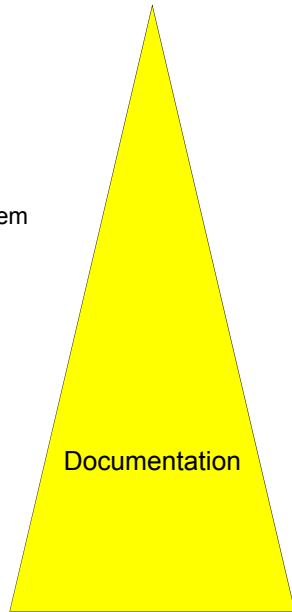
- Algorithm for assigning assignments:
 - List of all assignments will be published latest February 15th
 - Students have to consider two aspects:
 1. International or local group
 2. Interest in the different topics
 - There will be a list in which all students insert their preferences
 - We try to match as good as possible the indicated preferences
 - The group assignments will be published latest March 12th
 - Start working

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 the 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)

Marks and Grading (cont.)

- How to perform grading:
 - 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
 - Each oral examination is performed locally
- 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