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COMPUTE Software Group

DTU Compute

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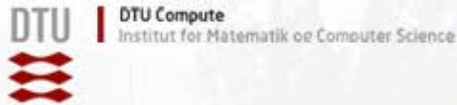
DTU Compute

Institut for Matematik og Computer Science



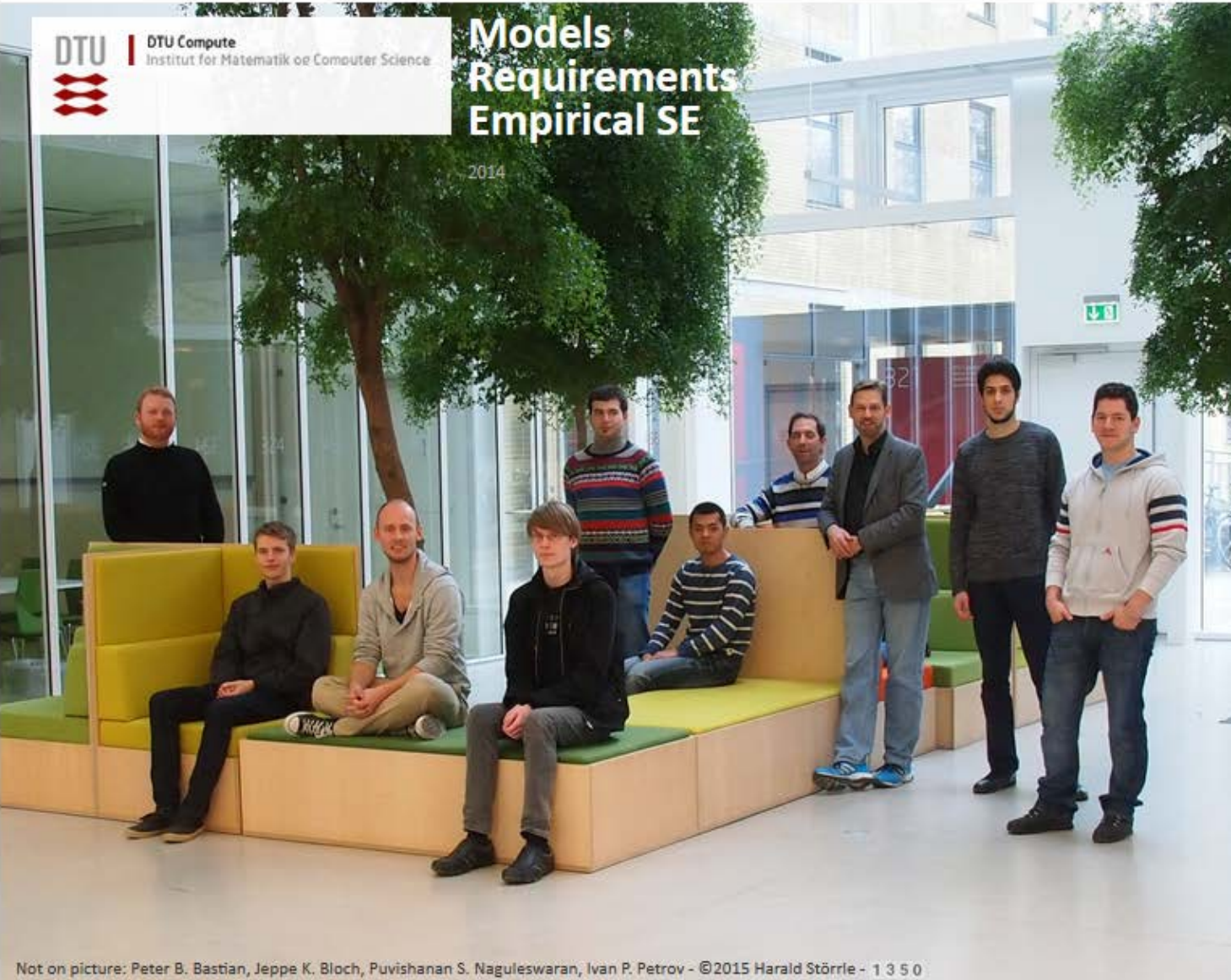


- **DTU (in 2013)**
 - 10,000 students
 - 31 BSc/BEng programs
 - 54 MSC programs
 - 19 PhD schools
 - 2,000 researchers
 - 1,400 PhD students (~50% international)
 - 2,500 other staff
 - 4,100 publications/year
 - 114 patents, 19 spin-offs
- **DTU sees itself as on a par with TUM and EPFL; according to some rankings it is**
 - (one of) the best *"in the nordic region"*,
 - and pretty good world-wide
- **COMPUTE (in 2014)**
 - DTU's largest Department
 - 194/107/42 Faculty/Phd students/other
 - 120/60/200 BEng/BSc/MSc degrees awarded
- **11 Sections**
 - Algorithms, Logic & Graphs
 - Image analysis & Computer graphics
 - Dynamic Systems
 - Embedded Systems Engineering
 - Cognitive Systems
 - Cryptology
 - Language-Based Technology
 - Mathematics
 - Scientific Computing
 - **Software Engineering**
 - Statistics & Data Analysis
- **Several centers/groups**
 - App-Garage and
 - **Software Group**
 - Danish High-Performance Cluster
 - ...

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Models Requirements Empirical SE

2014



RE tool support, and the RED tool in particular.

HuFaMo-Workshop

14.04.2015



Today, the MoDELS conference endorsed the 1st Workshop on Human Factors in Modeling to be on the program of this year's MoDELS conference in Ottawa. Please help spread the word for this novel format to promote empirical, human factors work in the modeling community - or submit your study!

ACM Europe Council Elections

13.03.2015



ACM wants to become the first truly global CS professional body. We seek to foster cooperation in Europe and support European policy makers by unbiased expertise when needed, to serve the best interest of society at large. Harald is running to become a member of the ACM Europe Council. The elections are held in May - can I count on your vote? :-)

COMPUTE Software Group

12.3.2015



The COMPUTE Software Group is releasing its web-page for the first time. The CSG is funded by the our department as a strategic initiative to foster the professionalisation of research prototypes. See [more!](#)

PNSE Co-Chair

Upcoming Elections for ACM Europe Council

The ACM Europe Council aims to increase the level and visibility of ACM activities across Europe, e.g.

- fostering the visibility and relevance of ACM in Europe, and
- encouraging greater participation of Europeans in all dimensions of ACM.



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**Vote for me to represent
Germany & Scandinavia!**



<http://europe.acm.org/>

- Summer School on Empirical Research Methods
- Hands on, ideal for early PhD students
- DTU (Copenhagen)
- August 17-21
- Register Now!

Empirical Research Methods in Informatics

A Summer School at the Technical University of Denmark, August 19-23, 2013, Kgs. Lyngby
Harald Störrle (hsto@dtu.dk)

Ever since the advent of the first electronic computers, Informatics has been dominated by inventing concepts and implementing them. However, over the last two decades, the methodological focus has continuously moved on, and nowadays, an empirical evaluation is often required to have papers accepted in areas like HCI or SE. To the right, a few landmarks of empirical research in HCI and SE are highlighted.

Still, empirical methods are not standard: papers often lack proper evaluation, and even if they don't, reviewers might not appreciate it. Sounds familiar? Then join in!

Early Stages

Mathematics and Electrical Engineering dominate Computer Science. "Software Engineering" is a contradiction in terms.

1968 beginning of "Software Engineering"

1982 1st CHI Conference HCI pioneers empirical techniques in CS

1996 LESE is founded 4 issues annually

1997 1st EASE Conference

2007 1st RESEK Conference

2010 1st RESEK Workshop

2011 LESE increases frequency impact factor 1.227 x 6

Contemporary Informatics

SE is scientifically accepted, but lacks industrial impact. Most work is conceptual, maybe implemented, but rarely validated empirically.

Future of Informatics

Practical work without empirical validation will be scientifically unacceptable. Industrial impact will grow due to solid evidence to support our claims.

Empirical Methods

There is no "best" empirical method, they all have their place: with different application conditions, expected results, and roles they play in the research lifecycle. It is essential to select a fitting paradigm for the questions under scrutiny in order to yield meaningful results - all too many existing studies fall short on this standard.

Roughly speaking, there is a spectrum from quantitative to qualitative research methods. Each one has its individual trade-off between objectivity and relevance of the results.

Experiments

An experiment is a methodical procedure for testing a hypothesis, with the intention of providing evidence for or against it.

The most straightforward empirical method is of course the controlled experiment. It can provide a high degree of control over influences biasing the results, and so allows to determine causal influences with a high degree of resolution.

Experimental results usually allow the use of quantitative methods, i.e. statistical tests. A very narrow focus is the price for high objectivity.

Field Work

Field work uses qualitative methods to study an object in its natural context. Thus, qualitative methods can achieve a higher level of external validity than controlled experiments - at the expense of reduced control over variables.

Qualitative methods include: interviews, observation, diaries and other research instruments known primarily from social science, but much of e.g. Software Engineering is actually a social activity, so this point of view is quite adequate for many research projects in Informatics.

Secondary Research

A survey is a method for collecting quantitative information about items in a population, e.g. people, publications, or specimens.

The most straightforward empirical method is of course the controlled experiment. It can provide a high degree of control over influences biasing the results, and so allows to determine causal influences with a high degree of resolution.

Surveys often use a mix of quantitative and qualitative methods. Psycho-social effects reduce the reliability of the results.

Course Objective and Outline

In this course, students will get an overview over the existing paradigms and their respective profiles, and have some first experience with each of them. Time allowing, this will include sessions with commonly used tools like R or MAXQDA.

It is unrealistic to expect becoming an empirical researcher through a single course like this one. But this is a first step that will open this methodological field to you, both for doing your own research, and for understanding (and reviewing) empirical results.

Literature

We will be using the following standard textbooks:

- C. Wohlin, R. Runeson, M. Höst, M.C. Ohlsson, B. Regnell, A. Wesslen: *Experimentation in Software Engineering: An Introduction*. Kluwer Academic Publishers, 2000
- J. Lazar, J. H. Feng, H. Hochheiser: *Research Methods in Human-Computer Interaction*. Wiley, 2010
- S. J. Taylor, R. Bagnall: *Introduction to Qualitative Research Methods*. Wiley, 2004

Additional reading (i.e., articles) will be distributed in the course; participants will receive a printed copy of the course material.

Course Outline

The course is driven by case studies and hands-on exercises, the results of which will be discussed in class. The overall structure of this tutorial is as follows:

- Part 1: Introduction to Empirical Informatics
- Part 2: Controlled Experiments
- Part 3: Field Work with Qualitative Methods
- Part 4: Secondary Research Methods
- Part 5: Study Design

All of the tutorial is aimed on concrete case studies and hands-on work by the participants, as this is how the participants will get the most out of this course!

Intended Audience

This course is targeted at two kinds of participants.

On the one hand, we cater for scientists who want to have an overview over empirical methodology in Software Engineering Research and get a kick-start for moving into this field. This might apply as well for PhD students and Post-Docs as for senior researchers interested in conquering new areas.

On the other hand, we target scientists who feel they are ill equipped to reviewing papers following an empirical methodology. The best way to appreciate a piece of work is to actually do it oneself!

>>Summer School

DTU

Contact

This course is offered by Associate Professor Harald Störrle (hsto@imm.dtu.dk). Get in touch if you have any questions or consult <http://www.imm.dtu.dk/~hsto/ERMSE>.



The Model Observatory

Why do people model and how do they use their models?

Are there any differences between different groups?

Does it pay to model, and if so: when and why?

Help us answer these questions and more by answering a few questions - it takes less than 5 minutes!



<http://tinyurl.com/MU-survey-2014>