

Application for approval of PhD course

Title in Danish and English:

Empirical Research in Interactive Systems (in Danish: Empirisk forskning I interactive systemer)

Language of instruction:

English

Number of academic credits:

5 ECTS

Time and days of instruction:

5 consecutive full days in autumn 2016

When the examination is:

4 weeks after the course

Type of instruction:

Lectures, student presentations, experiments and lab excursions

Form of assessment:

Written feedback on report handed in, presenting the results of an experiment done as a mandatory assignment during the course.

Grades:

Passed/ not passed

Any prerequisites or preceding courses:

An introduction book (MacKenzie, I. S. (2013). Human-computer interaction: An empirical research perspective. Waltham, MA: Morgan Kaufmann) must have been read before taking the course. A moderate knowledge of statistics will help. However, the course will teach the core details, such as how to build and present a linear regression model using a statistics program.

Objectives

This course is intended for students who are interested in learning about, or refining their skill in, empirical research methods in interactive systems. The course will be of particular interest to researchers (including students) who are striving to develop and evaluate new interfaces or interaction techniques, with the goal of publishing the results in a research journal or conference proceedings. As well as studying methods of evaluation with users, the course includes a focus on building and testing models of interaction, including descriptive, analytic, and predictive models.

Content

The following topics are included in this course:

- What is empirical research?
- What is the scientific method?
- Discovering and narrowing in on topics suitable for research in HCI
- Formulating "testable" research questions
- Modeling Interaction
- Types of models (descriptive, analytic, predictive)
- Examples of models (keystroke-level models, Fitts' law, 3-state model for graphical input, bimanual control model, etc.)
- How to design a user experiment to answer research questions
- Parts of an experiment (independent variables, dependent variables, counterbalancing, etc.)
- A real in-class experiment will be conducted (≈ 30 minutes)
- Experiment results (graphs, correlations, analysis variance, etc.)
- Experiment design issues (choosing between within subjects vs. between subjects factors, internal validity, external validity, control variables, confounding variables, counterbalancing test conditions)
- How to organize and write a successful research paper

Any comments

Scott MacKenzie will be the main course lecturer. His research is in human-computer interaction with an emphasis on human performance measurement and modeling, experimental methods and evaluation, interaction devices and techniques, alphanumeric entry, gaming, language modeling, and mobile computing. He has more than 160 publications in the field of Human-Computer Interaction (including more than 30 from the ACM's annual SIGCHI conference) and has given numerous invited talks over the past 25 years. Since 1999, he has been Associate Professor of Electrical Engineering and Computer Science at York University, Canada.

Contact person

John Paulin Hansen, MAN DTU. (jpha@dtu.dk, +45 40469626)

Keywords

Models of interaction, descriptive models, analytic models, predictive models, input devices and techniques, human perception and cognition, human motor performance, Venn diagram, predictive models, statistical tools, keystroke-level model, model predictions, model testing, Fitts' law, Hick-Hyman law, visual search model

Organiser(s):

John Paulin Hansen, MAN DTU. (jpha@dtu.dk, +45 40469626)

Henning Boje Andersen, MAN DTU

Jakob Bardram, Compute DTU

Jakob Eg Larsen, Compute DTU