HUMAN-COMPUTER INTERACTION

COURSE INTRODUCTION

Professor Bilge Mutlu
Computer Sciences, Psychology, & Industrial and Systems Engineering
University of Wisconsin–Madison

CS/Psych-770 Human-Computer Interaction
INTRODUCTIONS
INTRODUCTIONS

About me:

Bilge Mutlu, Assistant Professor

Human-Computer Interaction Laboratory, Director

PhD, 2009, Carnegie Mellon University

bilge@cs.wisc.edu, http://cs.wisc.edu/hci
WHAT IS THIS COURSE ABOUT?
HUMAN-COMPUTER INTERACTION
WHAT DOES HCI MEAN TO YOU?
PERSPECTIVES
DESIGN IMPLICATIONS

I would like to design a computer system and would like to gain a better understanding of what to design.
EVALUATION

I have designed a computer system and would like to understand whether it is any good.
THEORY

I would like to understand how a computer system that I designed affects people’s practices.
I would like to understand how an emerging computer technology affects how people communicate, related with each other, and use computer systems.
DEFINITIONS
“...a discipline concerned with the design, evaluation and implementation of interactive computing systems for human use and with the study of major phenomena surrounding them.”

— ACM
WHERE DOES HCI FIT WITHIN COMPUTER SCIENCE?
WHAT IS WRONG WITH THESE PICTURES?
“The old computing is about what computer can do, the new computing is about what people can do.”
— Schneiderman, 2002
THE COMPUTER

Old Computing

New Computing

THE HUMAN WORLD
AN INTERDISCIPLINARY FIELD

Computer science
Psychology
Communication
Design
Engineering

... Computing infrastructure
 Interface design
 Public policy
 Education
 Healthcare

...
HISTORY
With fewer European companies producing mass-market software, research remained more focused on less discretionary in-house development and use. At Loughborough University, HUSAT focused on job design (the division of labor between people and systems) and collaborated with the Institute for Consumer Ergonomics, particularly on product safety. In 1984, Loughborough initiated an HCI graduate program drawing on human factors, industrial engineering, and computer science. The International Conference on Human/Computer Interaction (INTERACT) conference, first held in London in 1984 and chaired by Shackel, drew HF&E and CHI researchers.

In a perceptive essay written later from a European perspective, Bannon urged that more attention be paid to discretionary use, while also criticizing the exclusive focus on initial experiences that marked CHI. Figure 1 positions some HCI events and topographics on a timeline. The top row represents the Human Factors and Ergonomics, predominantly nondiscretionary, HCI focus. In the center is HCI in MIS (or Information Systems), initially focused on use that was relatively nondiscretionary and hands-off. At the bottom are CHI and its logical antecedents as discretionarily use shifted from engineers to programmers to other individuals and groups.

Grudin, 2006
SOME HISTORY - 40S

Memex, 1945, Vannevar Bush

Stores all records/articles/communications

Items retrieved by indexing, keywords, cross-referencing

Information linked through associative trails
Man-Computer Symbiosis, 1960

J. C. R. Licklider wrote:

“Men will set the goals, formulate the hypotheses, determine the criteria, and perform the evaluations. Computing machines will do the routinizable work that must be done to prepare the way for insights and decisions in technical and scientific thinking.”
Some History - 60s

SketchPad, 1963

Ivan Sutherland’s PhD thesis at MIT: “Sketchpad: A Man-machine Graphical Communications System”

Hierarchy
Object-oriented graphics
Constraints
Icons
Copying
Light pen as input device
Recursive operations
SOME HISTORY - 60S

The Mouse, 1968

Douglas Engelbart, Stanford Research Institute (SRI)

“Mother of all demos”

Hierarchical hypertext
Multimedia
Windows
Shared files
Electronic messaging
Video conferencing
CONTROL TECHNOLOGIES
CONTROL DEVICES
CONTROL SOFTWARE
CONTROL HARDWARE
SOME HISTORY - 60S

Dynabook, 1968, Alan Kay (Xerox PARC)

Personal computer
Desktop interface
SOME HISTORY - 70S

Xerox Alto, 1973, Xerox PARC

First computer with

The desktop metaphor

GUI

Ethernet
Apple II, 1977, Apple
First mass production
Color graphics
SOME HISTORY - 80S

Xerox Star, 1981, Xerox PARC

First desktop computer to integrate

- Bitmapped display
- GUI
- Icons
- Folders
- Mouse
- Ethernet
- File & print servers
- Email
SOME HISTORY - 80S

The Knowledge Navigator, 1987

Apple ATG - Hugh Dubberly

Speech interfaces

Virtual agents
SOME HISTORY -80S

FutureShock, 1988

Apple ATG
Ubiquitous Computing, 1991

Mark Weiser (Xerox PARC)

The Computer for the 21st Century

“The most profound technologies are those that disappear. They weave themselves into the fabric of everyday life until they are indistinguishable from it.”
SOME HISTORY - 90S

Apple Newton, 1992
SOME HISTORY - 90S

AT&T “You Will” Ads, 1993-1994
Which ones of these technologies were realized?
TODAY AND TOMORROW
<table>
<thead>
<tr>
<th>Research Areas in HCI</th>
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<tbody>
<tr>
<td>Information visualization</td>
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<tr>
<td>Social computing</td>
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<tr>
<td>Mobile and ubiquitous computing</td>
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<tr>
<td>Computer-mediated communication</td>
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<tr>
<td>Assistive interfaces</td>
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<td>Socially interactive interfaces</td>
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<tr>
<td>Computer-supported collaborative work</td>
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<tr>
<td>Educational technology</td>
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<tr>
<td>Multi-modal interaction</td>
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<tr>
<td>Speech interfaces</td>
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<tr>
<td>Affective interfaces</td>
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<tr>
<td>MMOGs &amp; IVEs</td>
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QUESTIONS?
COURSE OUTLINE
CLASS SCHEDULE

Course Website:

http://cs.wisc.edu/hci/courses/hci

Location:

College Library 2192E

Time:

8:50 - 10:50 am

Effective time:

9:00 - 10:45 am
DISCUSSION & QUESTIONS

We’ll use Piazza!

http://www.piazza.com/wisc/fall2011/cspsych770
EXPECTED BACKGROUND

No prerequisites

Interest in HCI

Some knowledge of preparing presentations, programming, and prototyping

   Not everyone has to have all

   You will complement others’ skills
LEARNING GOALS

Gaining familiarity with

- HCI principles and literature
- Human-subjects research methods
- Semester-long research project

Having enough knowledge & tools to start research in HCI
WHY THOUGH?

Computer science PhDs tenure-track faculty placement by research area (CRA, 2009)
OVERVIEW OF SYLLABUS

Three tracks:

Principles ➜ Individual

Methods ➜ Individual

Project ➜ Individual/Group
TRACK I: PRINCIPLES

First half of Tuesday classes

Review of research topics in HCI

~3 papers/week

Students reflect on ONE of the papers in online forum (~250 words)

Due Monday midnights

Post on Piazza

Each week, I will present an overview and lead the discussion
METHODS

Second half of Tuesday classes
Every week a new method is presented
Six assignments on key methods
   Students practice methods in real problems
   1-page report of the process and results
TEXTBOOK(S)

Research Methods in Human-Computer Interaction

Statistics Explained
PROJECT

Thursday classes

Semester-long project in which you will practice HCI principles and research methods in one of the HCI research topics

   Individual or groups of two

   Worksessions, milestone, interim, and final presentations

   Poster session at the end of the semester

   Final two-to-four-page paper submittable to CHI or HRI conferences
PROJECT TOPICS

Explore user aspects of your existing research

One of the research questions I provide

  Research speed-dating next Thursday

A research question you develop

  Be prepared to present your ideas next week
OTHER GOALS

Some ulterior teaching goals:

Get comfortable with

- Discussing & challenging ideas,
- Giving each other feedback,
- Making presentations,
- Writing,
- Working in groups,
- General professionalism.
SOME POLICIES

Grading

Readings, reflection, and discussion 15%

Methods assignments 30%

Project 50%

Team-member evaluations — can affect up to 20% of the project grade

Participation & ulterior motives 5%

Scoring

94% → As

87% → ABs

80% → Bs
SOME POLICIES

Please be on time — 9 am

Missing class

Post on Piazza under “missing class”

Download slides + assignment from class website

If missing Thursdays, negotiate with project team (remember the team evaluation)
COMMUNICATION

I will email announcements
Post public/private questions on Piazza
My office hours are Mondays 1-2 pm
THE CLASSROOM

College Library Media Studio

Flexible space for project work
Computers and projectors for project work
Technical support (contact on the “Resources” page)
Meeting rooms, equipment checkout, printing and media services
QUESTIONS?
Next

**Week I Readings:** Paradigms of HCI

Will be posted on the website today

Due **Tuesday**

Comments due Monday night

**Assignment I:** University Human-Subjects Research Training

Will be posted on the website today

Due next **Thursday**

**Project**

Think about what project topics and identify areas of interest

Fill in skills survey — will be emailed — by **Wednesday midnight**

Due **Thursday**
THANKS!

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