CS/PSYC 6755
Human-Computer Interaction
Foundations and Design

Fall 2017

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Agenda

- Introductions
  - Me
  - You
- Administrative stuff...
- HCI Overview
  - Objectives
  - Principles
Introductions

➢ Instructor
  ❖ Bruce Walker
  ❖ Psychology & Computing
  ❖ GVU

➢ HCI - Alternative Interfaces
  ❖ Sonification & Auditory Interfaces
  ❖ Alternative Interaction Styles
  ❖ Engineering Psychology & Human Factors
  ❖ Assistive Technology

➢ Formative experiences...
  ❖ Grad School Decisions ”To Boldly Go…”
  ❖ NASA, IBM, Consulting
Introductions

➢ Teaching Assistants
  ❖ Keenan May
    • kmay @ gatech.edu
  
  ❖ Udaya Tattamangalam
    • udaya @ gatech.edu
Introductions

Your turn

Demographics:

- Males __  Females __
- <18 __  18-23 __  24-29 __  >30 __
- English __  Spanish __  Other language __
- Years Computer use:
  - <1 __  1-4 __  5-8 __  9-12 __  >12 __
- ??
Course Information

➢ Text Books


➢ Web

- Also via T-square
- Syllabus & Class Info
- Schedule
- Assignments
- Wiki
Grading

- Group project, 4 parts (45%)
  - More to come next time...
- Mid-term & final exams (30% total)
- Homeworks (15% total)
  - One week to do, likely 3 or 4 in total
- Participation (10% total)
  - Class involvement and peer review
  - Includes project involvement/effect
Resources

- Previous courses, courses elsewhere, info on the web, ...
  - Content, lectures, projects, ...
- Books
- Web sites
- Standards documents
- Go further
  - Move beyond lectures & book
  - Further courses
  - Step into research
HCI and Evidence-Based Design

Here we go...
What happens when a human and a computer system interact to perform a task?

- task - write document, calculate budget, solve equation, learn about Iran, drive home, make a reservation, land a plane...

Why is this important?

1. Computer systems affect every person
2. Safety, satisfaction, utility is critical
3. Product success depends on ease of use
Interfaces in the World

Not just computers!

- GPS
- Mouse
- Phone
- Copier
- Car
- Plane cockpit
- Airline reservation
- Air traffic control
- Home control
Thought Provoker #1

- Steering wheel head scratcher...
Thought Provoker #1

- Gotta see the details...
Thought Provoker #1

- The answer...? The issues...??
OMG! Head Exploding!

- Issues of...
  - Design
  - Internationalization
  - Supply Chain
  - Costs
  - Standards
  - Documentation
  - Training
  - ...etc., etc., etc....
Goals of HCI

- Allow users to carry out tasks
  - Safely
  - Effectively
  - Efficiently
  - Enjoyably
Usability

Crucial issue in this area!

Combination of

- Ease of learning
- High speed of user task performance
- Low user error rate
- Subjective user satisfaction
- User retention over time
How do we improve interfaces?

1. Educate software professionals
2. Draw upon fast accumulating body of knowledge and evidence regarding H-C interface design
3. Integrate UI design methods & techniques into standard software development methodologies now in place
Evidence-Based Design Process

➢ Tao of User-Centered Design
  ▶ Analyze user’s goals & tasks
  ▶ Create design alternatives
  ▶ Evaluate options
  ▶ Implement prototype
  ▶ Test
  ▶ Refine
Above All Else…

➢ Know the User!
   - Physical & cognitive abilities (& special needs)
   - Personality & culture, context
   - Knowledge & skills
   - Motivation, Wants, Needs
   - Etcetera, etcetera!!

➢ Two Fatal Mistakes:
1. Assume all users are alike
2. Assume all users are like the designer
“Looks good to me” isn’t good enough!

- Both subjective and objective metrics

- Some things we can measure
  - Time to learn
  - Speed of performance
  - Rate of errors by user
  - Retention over time
  - Subjective satisfaction
Course Overview

- Interdisciplinary teams
- The UCD Process and philosophy
- Know your user!
- Evaluate an existing system (without involving users)
- Design for success
- Dialog & interaction styles
- Evaluate your design (with users)
- Special topics
  - Ethics, InfoVis, Ubicomp, Agents, Audio
## Connections to Research Methods

<table>
<thead>
<tr>
<th></th>
<th>Needs Analysis</th>
<th>Design &amp; Prototype</th>
<th>Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research Methods for HCI</td>
<td>40%</td>
<td>20%</td>
<td>40%</td>
</tr>
<tr>
<td>HCI Foundations</td>
<td>25%</td>
<td>50%</td>
<td>25%</td>
</tr>
</tbody>
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**Diagram:**
- **Analyze/Evaluate:** Needs/Capabilities: User, Business, Market, Technology → Evidence/Requirements
- **Design/Build:** Artifact/Constraints → Product/App/Service
- **Context of use:**
  - **Context of development:**
- **Implement:** Design → Use & Evaluate
Upcoming

- History & Frameworks of HCI
- Project info
- Team training
- User Centered Design

Start reading...
- ID book *(note order of chapters on Schedule)*
- UYU book *(note order of chapters on Schedule)*
- DOET (if you want)
Group Project

Semester-long team effort
Group Project

- Design and evaluate an interface
  - P0 - Team formation & topic choice
  - P1 - Understand the problem space
  - P2 - Exploring the design space
  - P3 - Prototype
  - P4 - Evaluation

Main 4 parts worth ~10% each

- Presentation, documentation ~ 5%
Group Project Details

Part 0 - Topic definition
- Identify team & general topic
- Create web notebook (on WIKI)
- Suggestion: Pick a population and pick a technology; check out intersection

Part 1 - Understanding the problem
- Describe tasks, users, environment, social context
- What are implications for design?
Group Project Details

- **Part 2 - Design alternatives**
  - Storyboards, mock-ups for multiple different designs
  - Explore, push boundaries of design space
  - Explain decisions

- **Part 3 - System prototype & eval plan**
  - More detailed prototype (semi-working ok)
  - Plan for conducting evaluation
Part 4 - Evaluation

- Conduct formal evaluation with example users
- Use appropriate methods
- Analyze results of evaluation
- Characterize what’s working and what’s not
Presentations

- Review/Feedback Panels (3 x 1 hour)
  - Panels of 2nd year students
  - Review your project at the 3 earliest stages
  - Feedback, not solutions, from the panel

- Final poster session
  - Last day of classes
Project Teams

- 4 people
  - You decide (or I will!)
  - Diverse/balanced is best!
  - Consider schedules
  - Use the Online Team Forming Tool (T-Square)
- Cool project and team name for P0
- Team Contract
Semester theme: “Retail”

?? What does this mean ??

General Topic:
- By next Friday (“P0 due”)
- Set up web notebook on t-square wiki

Real “client” seems cool; but use caution
Instructor or TA can serve as client
What Makes a Good Project

Typically:

- Access to/knowledge of domain experts & users
- “Real” clients
- Interesting human issues
- Rich domain for design

Theme has a LOT of range for topics
Previous Topic Ideas

- Mobile/handheld (cars, tour guides, etc.)
- Wedding planner
- GIS
- Calendar agent (speech)
- Audio / Web sites
- Domain that you know well
- Browse old projects for more ideas...