CSC 540
Mobile App Development II

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Outline

Administrivia
Course Topics
Apple HIG Guidelines
Project
- Annotated Bibliography

Assignments
- Assignment #1
- Assignment #2

Administrivia

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Administrivia

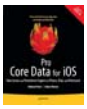
Office Hours
- Mon, 4:00pm-5:30pm CST826

Prerequisite
- CSC471: Mobile App Development

Web Page
- http://facweb.cs.depaul.edu/asteele/Courses/CSC540/default.html
- Detailed Administrivia (including syllabus) will be on the Web page

Administrivia

Book(s)
- Primary Text



ISBN:9781430233558
http://library.books24x7.com.ezproxy2.lib.depaul.edu/bookshelf.asp
Do a search for the book

Administrivia

Book(s)
- Supplemental Text

ISBN:9781430230243
http://library.books24x7.com.ezproxy2.lib.depaul.edu/bookshelf.asp
Do a search for the book

- We will also make use of readings and papers
  - **Designing From Both Sides of the Screen,**
    Ellen Isaacs, ISBN 978-0672321511

Administrivia

Grading

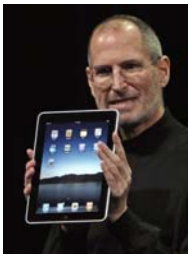
- Assignments 50%
- Final project 40%
  - **Proposal, Paper and Presentation**
- Attendance and Participation: 10%
  Participation for DL students will be evaluated based on submissions to the forums

Plagiarism & Incompletes

- Review relevant sections of website

Mobile Devices

iPhone Platform

Mobile Devices

IA Characteristics

- Simple
- Inexpensive
- Quick
- Pervasive

"Information Appliances are more noticeable by their absence than their presence"

Mobile Devices

Jan Chipchase

- Nokia researcher and TED presenter
  http://www.youtube.com/watch?v=Qn2NR901NMY

Mobile Devices

iPhone Platform

- The iPhone adoption rate was/is meteoric


Mobile Devices

iPad Platform

- The iPad's adoption rate is even greater
- Sold 4.5M in the first Quarter after its release

Mobile Devices

"What I like / What I hate"

- Try and articulate what you like or hate about one or more of your handheld devices
  - **User Interface**
  - **Style**
  - **Value**
  - **Anything else**
- You are a target consumer for handheld devices
  - **However, you probably have a different skill set from many of your intended users (especially for cell-phones)**
- Assignment #1 tries to begin this analysis

Mobile Devices

For the user the interface is a major part the device

- It should be easy to use and support the user's tasks

Mobile Devices

On Being a Butler

- Always available
- Always polite
- Rarely disturbs
- Always anticipates
- Provides gentle feedback

On Being an Employer

- Recognizes feedback
- Cooperate

Mobile Devices

Cooperative Principle for Technology

Don't Impose

- Respect user's physical effort
- Respect user's mental effort

Be Helpful

- Offer sufficient information; prevent errors
- Solve problems
- Predictable
- Relevant information only (plain language)

Mobile Devices

Respect Physical Effort

- **Treat clicks as sacred**
  - **Especially with complex clicks such as menus, scrolling, etc.**
- Trade extra implementation effort for user effort
- Implement undo rather than rely on confirmation

Mobile Devices

Respect Physical Effort contd.

- Design for the norm
- Think about the system as a whole
- Persistence
- Consider possible repetition
- Stick with an input mode
  - **Be careful of multiple input modes try to make sure the transactions can be completed in a single modality**

Mobile Devices

Respect Mental Effort

- Use visual elements sparingly
- Make common tasks visible/Hide infrequent tasks
- Give feedback/show signs of progress
  - **Let the user know if you can't comply with a request**
  - **Allow the user to interrupt the task**
  - **Combine sounds and visual cue**
- Default behavior is application behavior
  - **Use preferences only for appearance**

Mobile Devices

Respect Mental Effort contd.

- Use platform conventions
- Use widgetless features
  - **Microsoft spell-check**
  - **Auto scrolling**
  - **Only present legal input for addresses, etc.**
- Be careful about being too helpful
  - **Microsoft capitalization, list-making**

Mobile Devices

Be Helpful

- Try to prevent errors
- Give users relevant information about complex processes
- Use everyday language of users

Be Predictable

- Develop explicit conventions
- Don't mislead
  - **Gray out unavailable options**

iPhone App Design

Design Guidelines

- Apple iPhone Design Guidelines

http://developer.apple.com/library/ios/#documentation/UserExperience/Conceptual/MobileHIG/Introduction/Introduction.html

http://developer.apple.com/library/ios/documentation/userexperience/conceptual/mobilehig/MobileHIG.pdf [pdf]

http://surgeworks.com/blog/lab-mobile/iphone/how-to-build-an-iphone-user-interface-prototype-that-follows-apple-guidelines

iPhone App Design

Design Guidelines

- Apple HIG Guidelines give good advice once you have designed your application
- However, they are a little light when it comes to actually designing the application
- We will take a little detour into world of User Centered Design

  "Here be dragons"

iPhone App Design

User Centered Design

- "Here be dragons"

iPhone App Design

User Centered Design

- UCD Process

iPhone App Design

User Centered Design

- UCD Process - more detailed (and slightly different view)

iPhone App Design

User Centered Design

- A lot of these will be familiar to anyone with a Software Engineering background
- However, a some of these are UCD specific:
  - **Personas**
  - **Information Architecture (IA)**
  - **Interaction Design**
  - **Prototyping**

iPhone App Design

User Centered Design

- It's all about the User (Experience) UX
- You can get pretty far in terms of UX

You are not the user

Personas

Key users and Profiles

- Sally Shopper – Working mother, 43 years old
  - **Shops from computer at work and at home**
  - **Uses PC at work – Broadband connection**
  - **Has an iPhone – 4G connection**
  - **Family income: $60,000 a year**
  - **Divorced**
  - **2 children**

- Bob Buyer – Father, 36 years old
  - **Shops from computer at work and at home**
  - **Uses PC at work – Broadband connection**
  - **Has a iPad and PC at home – DSL connection**
  - **Family income: $80,000 a year**
  - **Married**
  - **No children**

Prototyping

Some of this discussion is taken from

- Prototyping for Tiny Fingers by Marc Rettig
- Discusses Lo-Fi Prototyping

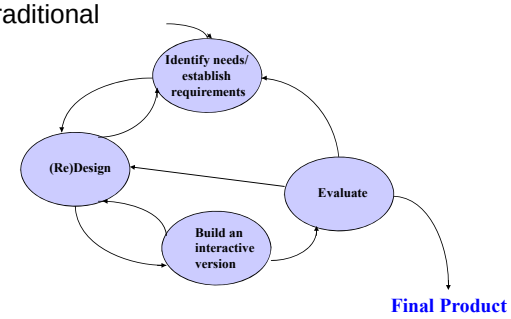
http://facweb.cs.depaul.edu/asteele/Courses/HCI430/Files/Tinyfingers.pdf

Reasons for Lo-Fi Prototyping

- Quick and dirty
- Users focus on function not on appearance
- Everyone feels that the design can be changed

Prototyping

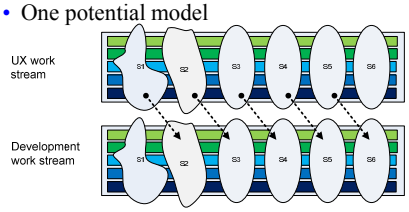
Traditional



Prototyping

Agile Prototyping

- One potential model



http://johnnyholland.org/2010/10/21/beyond-staggered-sprints-how-theladders-com-integrated-ux-into-agile/

Prototyping

Lo-Fi Prototyping

- Assemble the kit
- Set a deadline
  - **Less is more**
- Construct models not interfaces (illustrations)
- Test against users
- Evaluate results

Prototyping

Hi-Fi Prototypes

- Static: Illustrator, Photoshop, Visio
- Dynamic: VB, Flash, Silverlight
- Dynamic: Axure, iRise, Balsamiq, etc.
- More realistic interaction (esp. dynamic prototypes)
- Provides reference for implementation
- However, don't develop hi-fi prototypes too early

Prototyping

Prototyping and Construction

- What is a prototype?
- Why prototype?
- Different kinds of prototyping
  - low fidelity
  - high fidelity
- Compromises in prototyping
  - vertical
  - horizontal
- Construction

Prototyping

What is a prototype?

- In other design fields a prototype is a small-scale model:
  - **A miniature car**
  - **A miniature building or town**
- In other technical fields a prototype is a proof of concept
- From an interaction design perspective, there are many different reasons to create and use prototypes…

Prototyping

What is a prototype?

- In interaction design it can be (among other things)
  - **A series of screen sketches**
  - **A storyboard, i.e. a cartoon-like series of scenes**
  - **A Power Point slide show**
  - **A video simulating the use of a system**
  - **A lump of wood (e.g. Palm Pilot)**
  - **A cardboard mock-up**
  - **A piece of software with limited functionality written in the target language or in another language**

Prototyping

Why prototype?

- Evaluation and feedback are central to interaction design
- Stakeholders can see, hold, interact with a prototype more easily than a document or a drawing
- So team members can communicate effectively
  - **Designers ↔ Designers**
  - **Designers ↔ Developers**
- You can test out ideas
- It encourages reflection: very important aspect of design
- Prototypes answer questions, and support designers in choosing between alternatives

Prototyping

What to prototype?

- Navigation
- High priority use cases
- Technical issues
- Work flow, task design
- Screen layouts and information display
- Difficult, controversial, critical areas

Prototyping

Low-fidelity Prototyping

- Uses a medium which is unlike the final medium, e.g. paper, cardboard
- Is quick, cheap and easily changed
- Examples:
  - **Sketches of screens, task sequences**
  - **'Post-it' notes**
  - **Storyboards**
  - **'Wizard-of-Oz'**

Prototyping

Storyboards

- Often used with scenarios, bringing more detail, and a chance to role play

  Using Theatre Techniques to Write Effective, Byron Thomas UX MasterClass, Chicago, 2011

Personas

- They are a series of sketches showing how a user might progress through a task using the device
- Used early in design

Prototyping

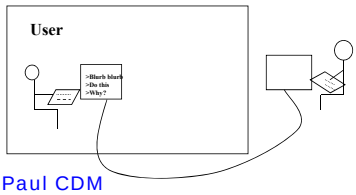
Sketching

- Sketching is important to low-fidelity prototyping
- Don't be inhibited about drawing ability
- Use a paper and pencil
  - **"The medium is the message"**
- There are tools that simulate sketching *e.g.* SketchFlow
  - **We will look at the advantages and disadvantages of using electronic media for sketching**

Prototyping

'Wizard-of-Oz' prototyping

- The user thinks they are interacting with a computer, but a developer is responding to output rather than the system.
- Usually done early in design to understand users' expectations
- What is 'wrong' with this approach?
- http://www.youtube.com/watch?v=YWyCCJ6B2WE



Prototyping

High-fidelity prototyping

- Uses materials that you would expect to be in the final product.
- Prototype looks more like the final system than a low-fidelity version.
- For a high-fidelity software prototype common environments include Flash, Visual Basic, stc.
- Danger is that users think they have a full system

Prototyping

Verify Requirements

- Iterative approach

Assumptions + Requirements

↓multiple steps

Assumptions + Requirements

Prototyping

Requirements

- Business/Marketing requirements
  - **BRD, MRD, PRD**
- Functional requirements
  - **Functionality**
  - **NFRs (Fit Criteria)**
- Technical requirements
  - **Platforms, etc.**
- Usability requirements
  - **What we know and love ☺**

Prototyping

Prototyping is also a way to innovate

- Serious Play, Michael Schrage

Prototyping

Prototyping Tool

- Axure
  - **Good Student Program**

    if your GPA > 3.0 then

    email or fax Axure support and request license

    Endif

- Email me for details if you are interested in getting ahold of Axure

iPhone App Design

Design Guidelines

- Apple HIG Guidelines

iPhone App Design

Apple HIG Guidelines

- Great iOS Apps Embrace the Platform and HI Design Principles
- Great App Design Begins with Some Clear Definitions
- A Great User Experience Is Rooted in Your Attention to Detail
- People Expect to Find iOS Technologies in the Apps They Use

Project

Course Project

- Should communicate an about mobile apps/devices that is of interest to your colleagues in class
- May be done independently, or in groups of two
- Ideas may come from past or current experience
- Should produce results that could be generalized and possibly published
  - **Develop a mobile app prototype that has principles of design that can be generalize**
  - **Discuss some aspect of mobile computing**
  - **Evaluate an application or a device (provide ideas for changes)**
  - **Something wild**

Project

Course Project

- The project can be a mix of both research and development
  - **This is a continuum**

Research Paper (7 pages) ↔ Implementation Project (2 or 3 pages + code)

Project

Research

- CDM Research Resources
  http://www.cdm.depaul.edu/SoC/research/Pages/ResearchLabs.aspx
- Library Resources
  http://library.depaul.edu/
- Google is always a good place to start
  - **Articles from conferences are not always available**
- Examples
  - **Paper on "guidance rewards"**

Robert Fabricant. 2005. Incorporating guidance and rewards into a handheld-device user experience. In *Proceedings of the 2005 conference on Designing for User eXperience* (DUX '05). AIGA: American Institute of Graphic Arts, New York, NY, USA, , Article 30.

Project

Tentative Schedule

- Week 3 – Discuss Project Proposal in Class
  - **DL students will have a wiki and we will set up a group Skype**
- Week 4 – Submit Project Proposal
- Week 7 – Present Project Progress
- Week 8 – Present Draft of Project
- Week 10 – Project Presentations
- Week 11 – Final Project Report due

Project

Project Proposal

- Explicitly declare what you plan to do for the project.
- Road map for completing the project
- Allows the instructor to provide feedback and suggestions.

Requirements

- The proposal should be about one to two pages in length.
- It should cover:
  - **Brief description of the topic.**
  - **Project participants and their roles.**
  - **Questions the project will address.**
  - **Activities that need to be performed.**
  - **Results that need to be collected.**
  - **How the results will answer the project's questions.**
  - **A timeline for accomplishing the project's goals.**

Project Proposal

Annotated Bibliography (Initial)

- 2-7 entries
- Each reference should have all bibliographic information (format: ACM, IEEE, etc.)
- ACM is preferred
  - http://www.cs.ucy.ac.cy/~chryssis/specs/ACM-refguide.pdf
  - http://www.ieee.org/documents/ieeecitationref.pdf
- Each reference should have a short (1-2 sentence) summary:

Robert Fabricant. 2005. Incorporating guidance and rewards into a handheld-device user experience. In *Proceedings of the 2005 conference on Designing for User eXperience* (DUX '05). AIGA: American Institute of Graphic Arts, New York, NY, USA, , Article 30.

Fabricant's paper discusses the design of a device to reduce the users stress by deep-breathing and bio-feedback. The team used "persuasive design" techniques to reinforce the user's behavior. Etc.

Project

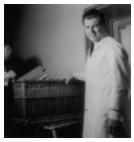
Bibliographic Manager

Mendeley

http://www.mendeley.com/

Note: it is not Mengele

Evil Bastard!



Assignment

Assignment #2

Put together in a document (put name on all pages)

- Short Project Description
  - **This can be a rough idea – it will be refined in the proposal**
  - **You can change this, if necessary**
- Annotated Bibliography

Next assignment we will begin coding

- Make sure you are comfortable with the iPhone development environment (Xcode)
  - ***e.g.* you should be able to make an application that use simple button navigation to move to one of two sub-views**