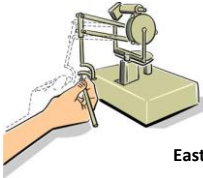## User Interface Design

Zhang, Xinyu, Spring 2014
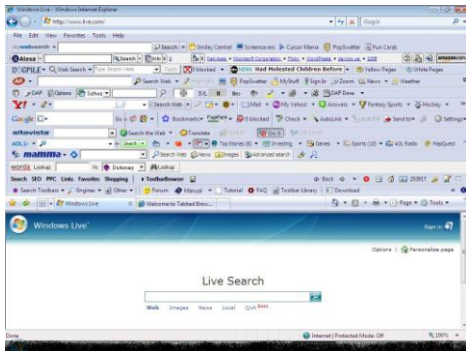
華東師範大學
East China Normal University
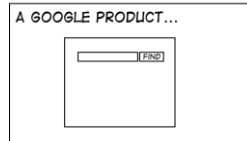
How About This User Interface?

Bad UI

Good UI

TYPICAL APPLE PRODUCT...

(TOUCH)

A GOOGLE PRODUCT...

[   ] [FIND]

Bad UI

YOUR COMPANY'S APP...

FIRST NAME:
LAST NAME:
SSN:
ID:
PHONE 1:
PHONE 2:
ADDR 1:
ACCT #:

TYPE CD:
TQP STAT:
VER:
CAT CD:
CITY:
STATE:
ZIP:
ORD #:

FT/PT:

OKAY   APPLY   SAVE   UNDO   HELP   DELETE   EDIT
SELECT   BROWSE   ERRORS

STUFFTHATHAPPENS.COM BY ERIC BURKE

Windows 7

Office & Desk

BumpTop

http://www.bumptop.com
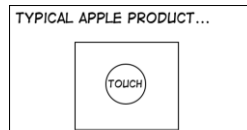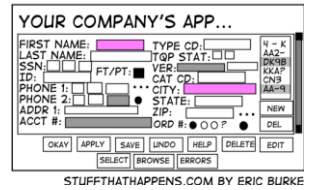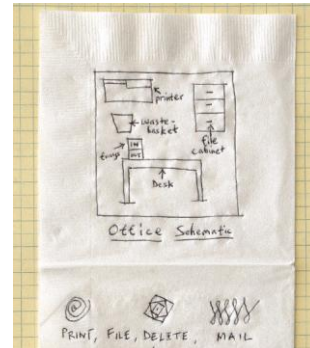

Dear BumpTop fans,
More than three years ago, we set out to completely change the way people use their desktops. We're very grateful for all your support over that time — not just financially but also through all the encouraging messages from people who found BumpTop inspiring, useful, and just downright fun.
Today, we have a big announcement to make: we're excited to announce that we've been acquired by Google! This means that BumpTop (for both Windows and Mac) will no longer be available for sale. Additionally, no updates to the products are planned.
For the first week of May 2010, we kept BumpTop Free available for download to give BumpTop fans one last chance to grab a copy. BumpTop is now no longer available for free download.
Thanks again for all your support over the years. Despite our change in strategy, we remain as passionate as ever about helping shape the future of computing!
Sincerely,

The Bumps April 30th 2010

Perceptive Pixel

Robot Motion and Vision Laboratory
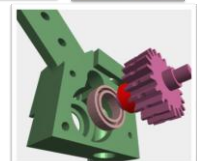## Software Engineering Institute, ECNU

Early Work

– Games, Graphics & Virtual Reality
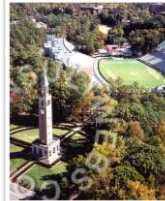– Robotics
– CAD/CAM (virtual prototyping)

Early Work

— Cloth
— Deformable Objects
— Articulated Models

About Me

- Ph.D. 2004 Zhejiang University
- South Korea
- Singapore
- U.S.A.

Topics for Today

- Course Overview
- Class Project Description
- Course Mechanics
- Assignments

Course Overview

-- HCI, UI, Usability, Iterative Design

This Course

- Is about reliably building very good interactive systems.
- We focus on **mobile applications**.
- The goal is not to build a working system, but an interactive prototype.
- We place emphasis on fieldwork, rapid prototyping and user testing to find the right design and avoid obvious and not-so-obvious mistakes.

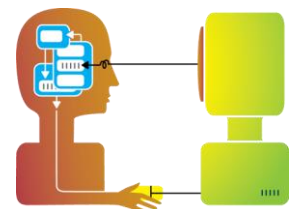## Human-Computer Interaction (HCI)

Human
- End-user of program
- Others (friends, collaborators, coworkers)

Computer
- Machine program runs on
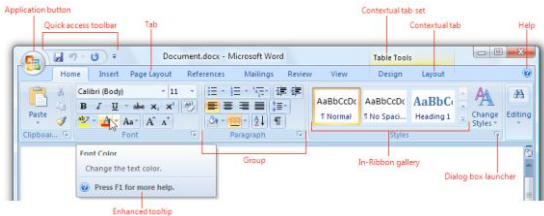- Often split: clients & servers

Interaction
- User tells the computer

User Interface (UI)

Part of application that allows
- People to interact with computer
- Computer to communicate results

User Interface (UI)

Part of application that allows
- People to interact with computer
- Computer to communicate results

Can include hardware design
- Buttons, sliders, other sensors

HCI =
design, prototyping, implementation
& evaluation of UIs

Why Study User Interfaces?

"The results show that in today's applications, an average of 48% of the code is devoted to the user interface portion.
The average time spent on the user interface portion is 45% during the design phase, 50% during the implementation phase, and 37% during the maintenance phase."

– *Myers & Rosson*, CHI'92
  User interface programming survey, ACM

Brad A. Myers
Professor
Human Computer Interaction Institute
School of Computer Science
Carnegie Mellon University

Mary Beth Rosson
Professor
Pennsylvania State University

Why Study User Interfaces?

- Major part of work for "real" programs (approx 50%)

- You will work on "real" software
  intended for people other than yourself

- Bad user interfaces cost
  money, lives, …

- User interfaces hard to get right
  people are unpredictable

AA Flight 965

1995 American Airlines jet crashed into canyon wall, killing all aboard on approach to Rozo airport in Colombia

Pilot skipped some of the approach procedures

Pilot typed in "R" and system completed full name of airport to Romeo

Guidance system executed turn at low altitude to head for Romeo airport 9 seconds later plane struck canyon wall

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Life-Threatening Errors

User Interface (UI)


What is Usability?

- Ease of learning
  Faster the second time and so on...
- Recall
  Remember how from one session to the next
- Productivity
  Perform tasks quickly and efficiently
- Minimal error rates
  If they occur, good feedback so user can recover
- High user satisfaction
  Confident of success

Who Builds Interfaces?

Ideally a team of specialists
- graphic designers
- interaction / user experience designers
- technical writers
- marketers
- test engineers
- software engineers
- customers

Interface Design Cycle
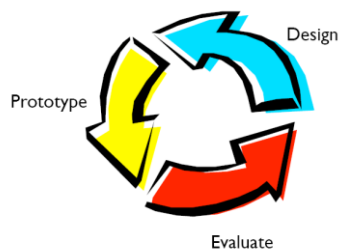
Building Successful Interfaces

1. Task analysis & contextual inquiry
2. Rapid prototyping
3. Evaluation
4. Iteration: Back to 1

Task Analysis & Contextual Inquiry

- Observe existing practices

- Create scenarios of actual use

- Create models to gain insight into work processes

Rapid Prototyping

- Build a mock-up of design (or more!)
- Low fidelity techniques
  Paper sketches
  Cut, copy, paste
  Video segments
- Interactive prototyping tools
  HTML, Flash, Javascript,
  Visual Basic, C#, etc.
- UI builders
  Interface Builder, Visual Studio, NetBeans

Evaluation

- Evaluate analytically (no users)
- Test with real target users
- Low-cost techniques
  expert evaluation
  walkthroughs
- Higher cost
  Controlled usability study

Goals of the Course

Learn to design, prototype, evaluate interfaces
- Discover tasks of prospective users
- Cognitive/perceptual constraints that effect design
- Techniques for evaluating an interface design
- Importance of iterative design for usability
- Technology used to prototype & implement UI code
- How to work together on a team project
- Communicate your results to a group

Many of these will be key aspects of your future jobs

Class Project Overview

-- Mobile Applications, Developed in Teams

Theme: Mobile Applications

Mobile applications are different:

• Different tasks (local search, not word processing)
• I/O constraints (slow text entry, few pixels)
• Input opportunities: Sensing
  (touch, orientation, acceleration, location, camera)
• Portability
• Internet connectivity

Course Platform: Google Android

• You can use your own Smart Phone or Pad.
• Coding assignments can be completed in the emulator.
• Development path:
  Java + Android SDK – 3 assignments to get you up to speed

Inspiration: Particular Users
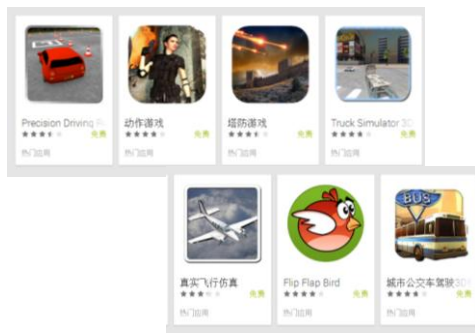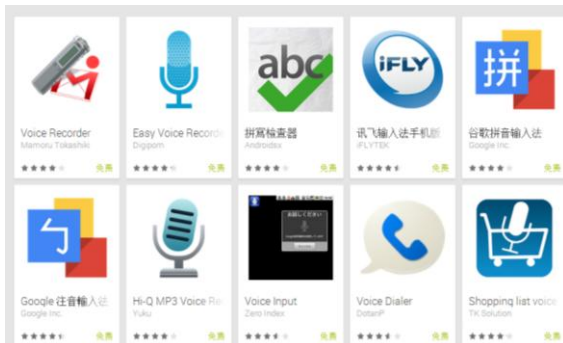

Inspiration: Location-based Apps

https://foursquare.com/

https://yelp.com/

https://google/maps

Inspiration: Input

Inspiration: Device-As-Instrument

Course Mechanics

-- Office Hours, Assignments, Grading

Prerequisites

- You must be comfortable with programming.
- Programming assignments require you to write code in JAVA with the Android SDK.
- You must commit to working with your team on your group project.

Class Time & Place

- 3:00PM—4:40PM
- Friday
- Room 307

Textbook & Readings

- CS160: User Interface Design, UC Berkeley
- Lecture Notes

Email: hci2014ecnu@gmail.com

Course Website

Under construction

Grading

- The cumulative grade based on the following

ACTIVITIES	PERCENTAGES (100%)
Assignments	30%
Team Presentation	20%
Final Team Project	50%

- Bonus
  - Leading presenters get 5 extra points

48

Assignments & Projects

- Three individual programming assignments during the semester.

  Goals:
  - Make sure you have the skills to implement your group project
  - Individual performance metric
- Group project assignments throughout semester

Assignment 1

1. Install Google Android SDK and JAVA
2. Set up Eclipse development environment for Android
3. Create a simple tip calculator.
4. Submit binary, source, screenshots to hci2014ecnu@gmail.com