

Introduction to Human Centered Requirements and Design

SWEN444

Difficult to use Products?

- Think about a product that you have found to be difficult to use:
 - What was the difficulty and the consequences of the product being difficult?
 - What do you think contributes to or causes the difficulty?
- Now think of a product you really like to use!

“It is easy to write software that is hard to use and hard to write software that is easy to use”

Why Study Human-Computer Interaction (HCI) and Software Engineering?

- Virtually all **“real” systems have a HCI**
 - Graphical user interfaces (GUI) on desktops, laptops, web applications
 - Embedded “smart” devices, non-traditional interfaces
- **Bad UI’s cost:**
 - Money (your product will be a flop)
 - Safety (vehicles crash, medical equipment mis-used)

HCI is Multidisciplinary, including:

- **Software Engineering / Computer Science**
- **Psychology / Cognitive Science**
 - Knowledge of user's perceptual, cognitive, problem-solving skills
- **Ergonomics**
 - Knowledge of design to accommodate the user's physical and cognitive abilities
- **Sociology**
 - Helps to understand the wider context of the interaction
- **Business**
 - Markets the system, determines the value
- **Graphic Design**
 - Designs the user interface (element) presentations - aesthetics
- **Communications**
 - Technical writing to produces training materials, manuals, etc.
 - Effective information interaction

Psychology and Cognitive Science

- HCI based on psychology and cognitive science principles

“Usability guidelines live for a long time; usability methods live even longer. Human behavior changes much more slowly than the technology we all find so fascinating, and the best approaches to studying this behavior hardly change at all.”

Jakob Nielsen

Who Builds Interfaces?

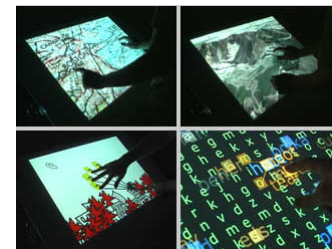
- Ideally: A multidisciplinary team of specialists
 - Graphic designers
 - UX interaction designers
 - Ergonomic specialists
 - Technical writers
 - Marketers
 - Software engineers
 - Customers and users

Changing Concept of Computing and Interaction

- “The world is not a desktop” — Tscheligi, 2005 (paraphrasing Mark Weiser)
- Usability
 - Help **novices** become **experts**
 - Help experts be highly **productive**

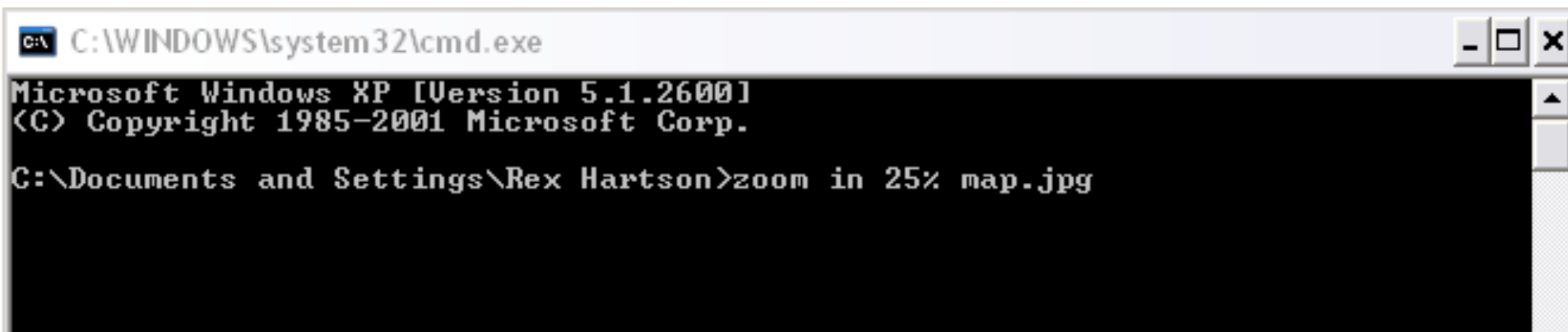
Progressing from Usability to UX

- Progression from narrow focus on **task performance** to **entire user experience**
 - Emotion, social and cultural implications
 - Fun, style, art
 - Branding, reputation
 - Political, social, personal connection
- Interaction in the UX context is broad...
 - Seeing, touching, and thinking about system or product
 - Admiration and anticipation **before** any physical interaction
 - Entire experience **during** interaction
 - Savoring memory **after** interaction



Progressing from Usability to UX

- An example: User to zoom in on map image
 - Old days, command language input

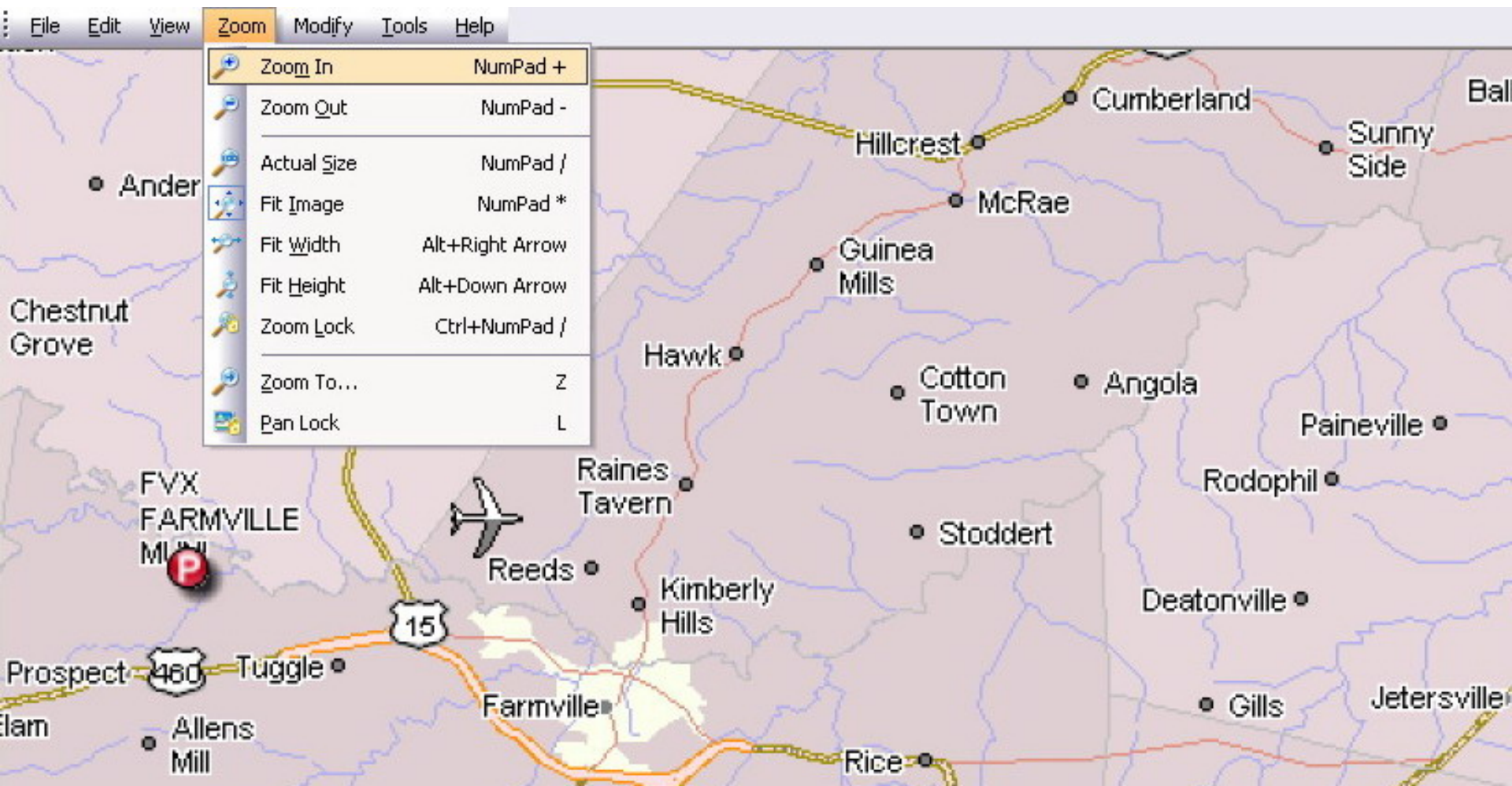
A screenshot of a Windows XP command prompt window. The title bar shows the path 'C:\WINDOWS\system32\cmd.exe'. The window content displays the following text:

```
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

C:\Documents and Settings\Rex Hartson>zoom in 25% map.jpg
```

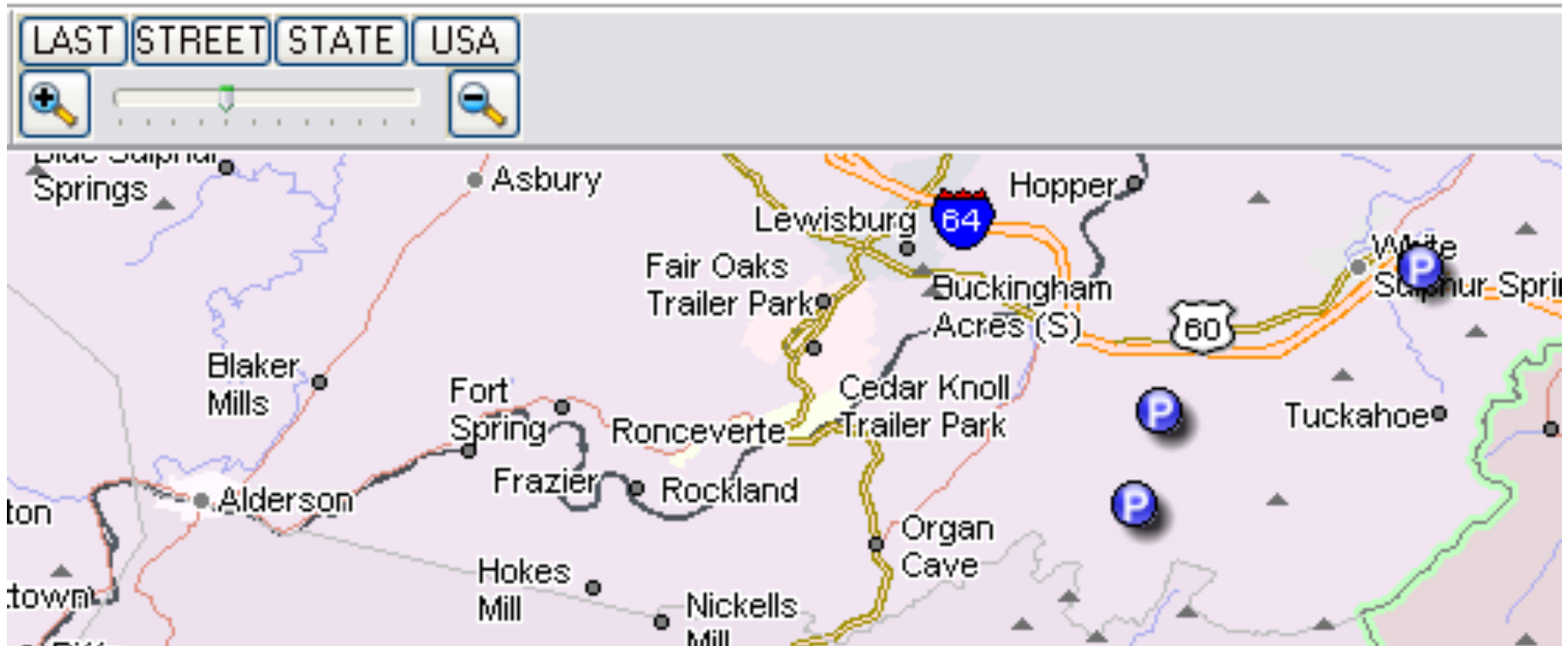
Progressing from Usability to UX

- Command, via pull-down menu



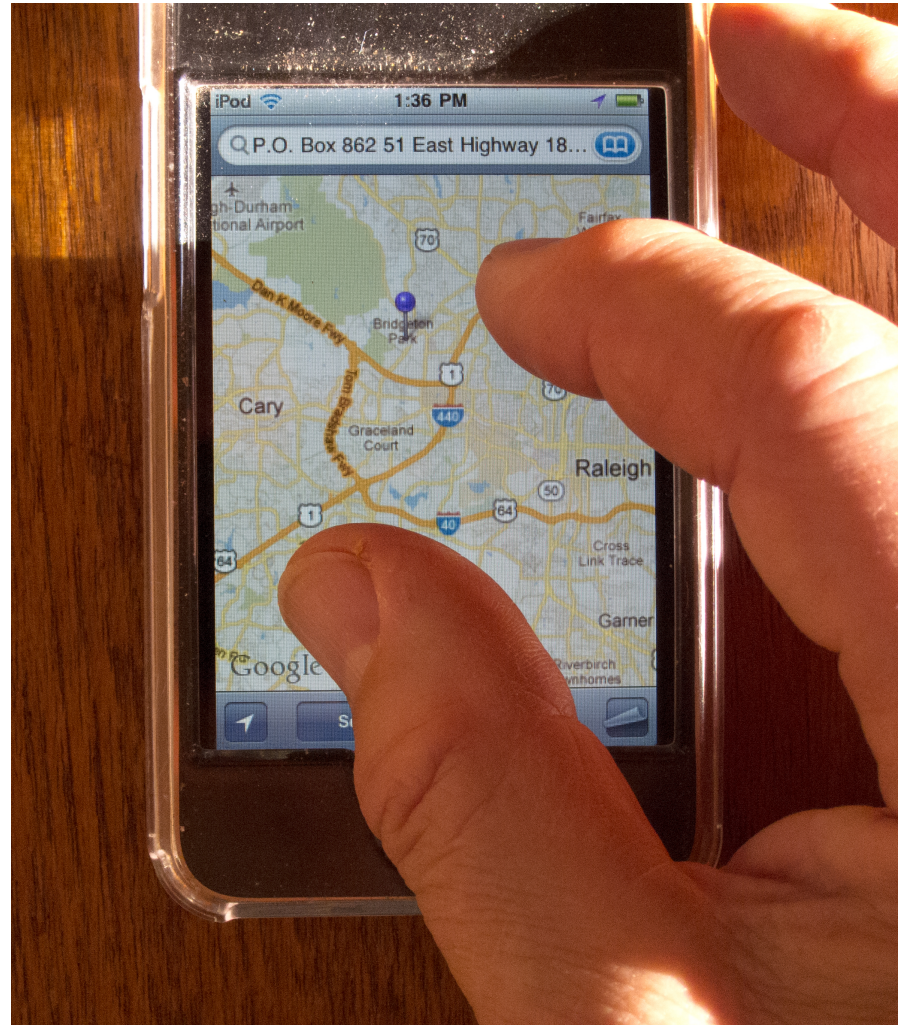
Progressing from Usability to UX

- Direct manipulation, click on “+” or “-” icon



Progressing from Usability to UX

- Embodied, finger gesture (multi-touch)
- Makes you realize that direct manipulation with a mouse is not so direct



Components of UX

- Usability
 - Learnability, memorability, productivity, understandability, user satisfaction
- Usefulness
 - System functionality ...
 - Gives ability to use system or product to **accomplish goals** of work (or play)
- Emotional impact
 - About user feelings: engagement, self-identity, aesthetics, “coolness” factor, joy of use
 - (Relates to user satisfaction)

Enjoyment is fundamental to life.

Hassenzahl, Beu, and Burmester

Measuring UX

- **Hard to measure** directly
- **Usability** and **usefulness** evaluation
- **Emotional impact** more **challenging**
 - Estimate UX via qualitative and quantitative indicators
 - Qualitative **interviews, surveys, observation** to understand before, during, after experience