CPE/CSC 484: User-Centered Design and Development

Franz J. Kurfess

Computer Science Department
California Polytechnic State University
San Luis Obispo, CA, U.S.A.

484-S12 Quarter

❖ **Since the time for lectures in week 3 is very short due to the UCD tools presentations, I'm using only a very small subset from this chapter. As a consequence, many of the slides are "skipped" or "hidden."**

Monday, April 9, 12

Chapter 5

Emotional Interaction

Monday, April 9, 12

Overview

- Emotions and the user experience
- Expressive interfaces
  - how the 'appearance' of an interface can affect users

- Frustrating interfaces
  - what are they and how to reduce them
- Persuasive technologies and behavioral change
  - how technologies can be designed to change people's attitudes and behavior

- Anthropomorphism
  - The pros and cons
- Models of emotion

Monday, April 9, 12

Motivation

❖ **functionality and performance aspects are not always sufficient to make users comfortable**

❖ **expressive interfaces can convey additional information to the user**

❖ **affective computing has to be used with care, it gets annoying very easily**

Monday, April 9, 12

Objectives

❖ **be aware of the effects that the use of expressive computing methods can have in user interaction**

❖ **identify appropriate techniques that enhance the user's comfort level with the system**

❖ **balance the quality, quantity, and expressiveness of feedback from the system to the user**

❖ **identify and avoid common mistakes that can lead to user frustration**

Monday, April 9, 12

Emotions and the user experience

- HCI has traditionally been about designing efficient and effective systems

- Now more about how to design interactive systems that make people respond in certain ways
  - e.g. to be happy, to be trusting, to learn, to be motivated

- Emotional interaction is concerned with how we feel and react when interacting with technologies

Monday, April 9, 12

Emotional interaction

- What makes us happy, sad, annoyed, anxious, frustrated, motivated, delirious and so on
  - translating this into different aspects of the user experience
- Why people become emotionally attached to certain products (e.g. virtual pets)
- Can social robots help reduce loneliness and improve wellbeing?
- How to change human behavior through the use of emotive feedback

Expressive interfaces

- Provide reassuring feedback that can be both informative and fun

- But can also be intrusive, causing people to get annoyed and even angry

- Color, icons, sounds, graphical elements and animations are used to make the 'look and feel' of an interface appealing
  - conveys an emotional state

- In turn this can affect the usability of an interface
  - people are prepared to put up with certain aspects of an interface (e.g. slow download rate) if the end result is appealing and aesthetic

Monday, April 9, 12

User-created expressiveness

- Users have created a range of *emoticons* - compensate for lack of expressiveness in text communication:

    Happy :)

    Sad :<

    Sick :X

    Mad >:

    Very angry >:-(

- Also use of icons and shorthand in texting and instant messaging has emotional connotations, e.g.

    LOL, I 12 CU 2NITE

Monday, April 9, 12

Activity: Font Selection Tool

❖ **two variations of a toolbox to identify important properties**

   ❖ type face

   ❖ formatting

   ❖ ...

❖ **identical functionality**

   ❖ all options are available through both version

❖ **different presentation/appearance**

Monday, April 9, 12

Which one do you prefer?

Monday, April 9, 12
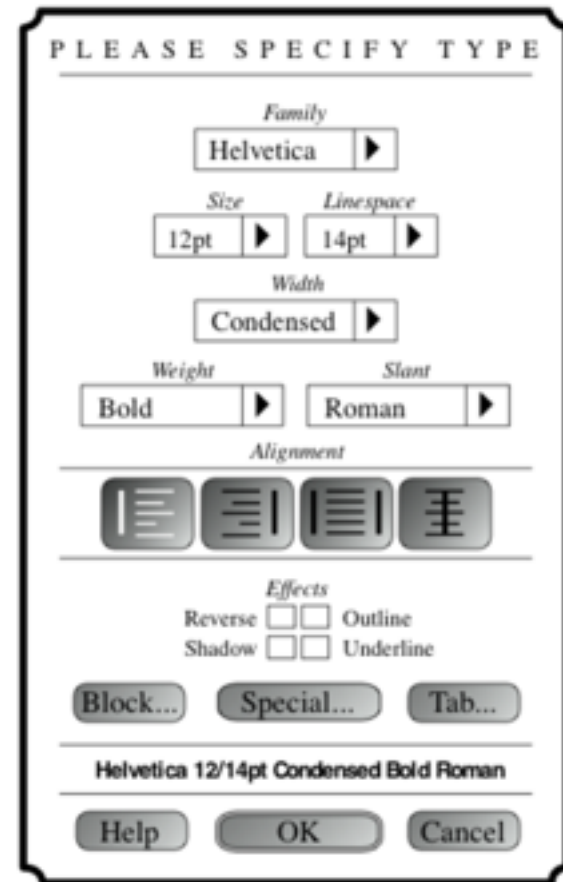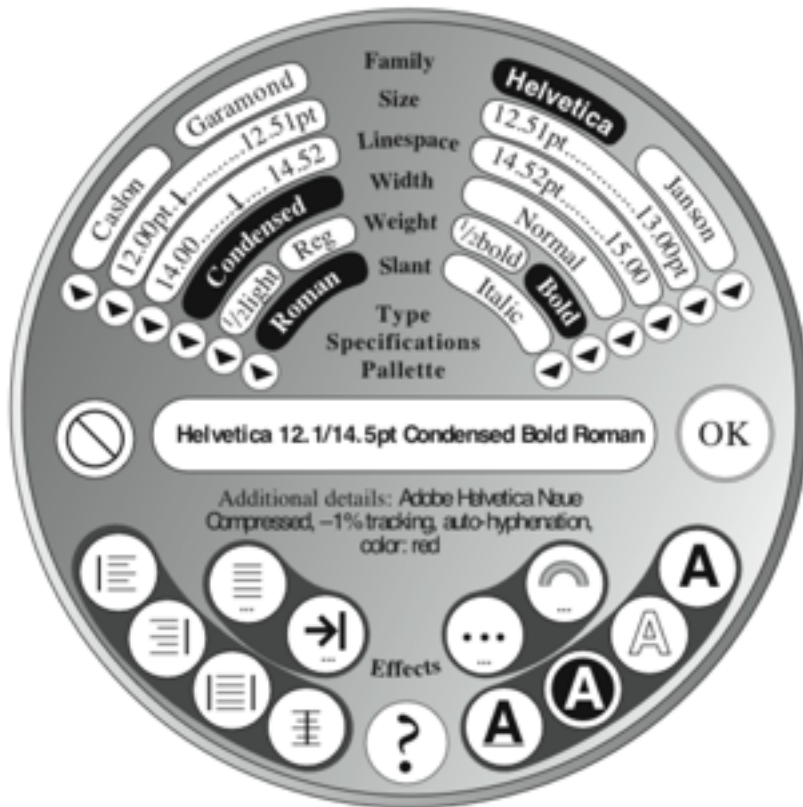
Marcus and Teasley study

- Marcus (1992) proposed interfaces for different user groups
  - Left dialog box was designed for white American females
  - Who "prefer a more detailed presentation, curvilinear shapes and the absence of some of the more brutal terms ... favored by male software engineers."
  - Right dialog box was designed for European adult male intellectuals
  - who like "suave prose, a restrained treatment of information density, and a classical approach to font selection"

- Teasley et al (1994) found this not to be true
  - the European dialog box was preferred by all and was considered most appropriate for all users
  - round dialog box was strongly disliked by everyone
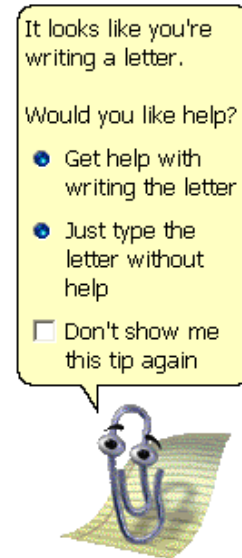
Friendly interfaces

- Microsoft pioneered friendly interfaces for technophobes - 'At home with Bob' software

- 3D metaphors based on familiar places (e.g. living rooms)

- Agents in the guise of pets (e.g. bunny, dog) were included to talk to the user
  - Make users feel more at ease and comfortable

Monday, April 9, 12

Bob

Monday, April 9, 12

Clippy

- Why was Clippy disliked by so many?

- Was it annoying, distracting, patronising or other?

- What sort of user liked Clippy?

It looks like you're writing a letter.

Would you like help?

- Get help with writing the letter
- Just type the letter without help

☐ Don't show me this tip again

Monday, April 9, 12

User Frustration

- **rational aspect**
  - the system does not do what the user wants it to do
  - tolerable if it is (more or less) expected

- **emotional aspect**
 - the user is upset about this
    - mismatch with the mental model the user has
    - disregard of the user's perspective by the designer
  - may affect the system as a whole
    - even if only a small part causes the frustration
  - may be difficult to recover from

Monday, April 9, 12

Frustrating interfaces

- Many causes:

  - When an application doesn't work properly or crashes
  - When a system doesn't do what the user wants it to do
  - When a user's expectations are not met
  - When a system does not provide sufficient information to enable the user to know what to do
  - When error messages pop up that are vague, obtuse or condemning
  - When the appearance of an interface is garish, noisy, gimmicky or patronizing
  - When a system requires users to carry out too many steps to perform a task, only to discover a mistake was made earlier and they need to start all over again

Monday, April 9, 12

Gimmicks

- Amusing to the designer but not the user, e.g.
  - Clicking on a link to a website only to discover that it is still 'under construction'

This page is under construction...
we have big plans for this page, so
come back often

Monday, April 9, 12
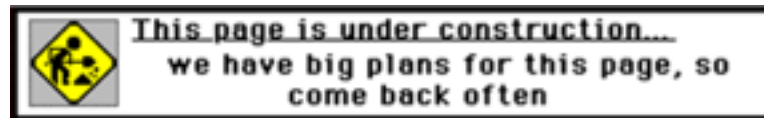
Error messages

"The application Word Wonder has unexpectedly quit due to a type 2 error."

Why not instead:

"the application has *expectedly* quit due to poor coding in the operating system"

- Shneiderman's guidelines for error messages include:
  - avoid using terms like FATAL, INVALID, BAD
  - Audio warnings
  - Avoid UPPERCASE and long code numbers
  - Messages should be precise rather than vague
  - Provide context-sensitive help

Monday, April 9, 12

Website error messages

Error 404 – Web Page Not Found

FLPPS009

FastLane Error!

Your login information is incorrect...

Please verify that you typed in your Last Name, SSN and Password correctly. If you still cannot login, Please contact the FastLane Administrator regarding your access rights.

Return To Previous Page

Monday, April 9, 12

More helpful error message

"The requested page **/helpme** is not available on the web server.

If you followed a link or bookmark to get to this page, please let us know, so that we can fix the problem. Please include the URL of the referring page as well as the URL of the missing page.

Otherwise check that you have typed the address of the web page correctly.

The Web site you seek
Cannot be located, but
Countless more exist."

Monday, April 9, 12

Should computers say they're sorry?

- Reeves and Naas (1996) argue that computers should be made to apologize

- Should emulate human etiquette

- Would users be as forgiving of computers saying sorry as people are of each other when saying sorry?

- How sincere would they think the computer was being? For example, after a system crash:
  - "I'm really sorry I crashed. I'll try not to do it again"

- How else should computers communicate with users?

Monday, April 9, 12

Persuasive technologies and behavioral change

- Interactive computing systems deliberately designed to change people's attitudes and behaviors (Fogg, 2003)

- A diversity of techniques now used to change what they do or think
  - Pop-up ads, warning messages, reminders, prompts, personalized messages, recommendations, Amazon 1-click
  - Commonly referred to as nudging

Monday, April 9, 12

Nintendo's Pocket Pikachu

- Changing bad habits and improving well being

  – Designed to motivate children to be more physically active on a regular basis

  – owner of the digital pet that 'lives' in the device is required to walk, run, or jump

  – If owner does not exercise the virtual pet becomes angry and refuses to play anymore

Monday, April 9, 12

How effective?

- Is the use of novel forms of interactive technologies (e.g., the combination of sensors and dynamically updated information) that monitor, nag, or send personalized messages intermittently to a person more effective at changing a person's behavior than non-interactive methods, such as the placement of warning signs, labels, or ads in prominent positions?

Monday, April 9, 12

Which is most effective?

Monday, April 9, 12

Energy reduction

Monday, April 9, 12

Phishing and trust

- Web used to deceive people
  into parting with personal details
  - e.g. Paypal, eBay and won the lottery letters
- Allows Internet fraudsters
  to access their bank accounts
  and draw money from them
- Many vulnerable people
  fall for it
- The art of deception is centuries old
  but internet allows ever more
  ingeniuos ways to trick people

Monday, April 9, 12

Anthropomorphism

- Attributing human-like qualities to inanimate objects (e.g. cars, computers)

- Well known phenomenon in advertising
  – Dancing butter, drinks, breakfast cereals

- Much exploited in human-computer interaction
  – Make user experience more enjoyable, more motivating, make people feel at ease, reduce anxiety

Which do you prefer?

1. As a welcome message

- "Hello Chris! Nice to see you again. Welcome back. Now what were we doing last time? Oh yes, exercise 5. Let's start again."

- "User 24, commence exercise 5."

Monday, April 9, 12

Which do you prefer?

2. Feedback when get something wrong

1. *"Now Chris, that's not right. You can do better than that.Try again."*
2. *"Incorrect. Try again."*

Is there a difference as to what you prefer depending on type of message? Why?

Monday, April 9, 12

Evidence to support anthropomorphism

- Reeves and Naas (1996) found that computers that flatter and praise users in education software programs -> positive impact on them

"Your question makes an important and useful distinction. Great job!"

- Students were more willing to continue with exercises with this kind of feedback

Monday, April 9, 12

Criticism of anthropomorphism

- Deceptive, make people feel anxious, inferior or stupid

- People tend not to like screen characters that wave their fingers at the user and say:
  – Now Chris, that's not right. You can do better than that.Try again."

- Many prefer the more impersonal:
  – "Incorrect. Try again."

- Studies have shown that personalized feedback is considered to be less honest and makes users feel less responsible for their actions (e.g. Quintanar, 1982)

Monday, April 9, 12

Virtual characters

- Appearing on our screens in the form of:
  - Sales agents, characters in videogames, learning companions, wizards, pets, newsreaders

- Provides a persona that is welcoming, has personality and makes user feel involved with them
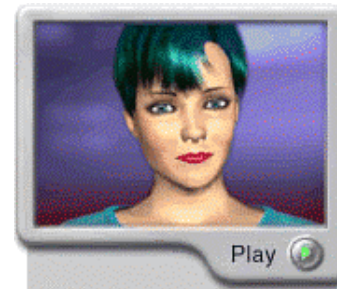
Disadvantages

- Can lead people into false sense of belief, enticing them to confide personal secrets with chatterbots

- Annoying and frustrating
  - e.g. Clippy

- May not be trustworthy
  - virtual shop assistants?

Monday, April 9, 12

Rea the realtor

- Rea showing user an apartment

- Human-like body

- Uses gesture, non-verbal communication (facial expressions, winks) while talking

- Sophisticated AI techniques used to enable this form of interaction

Cassell, 2000, MIT

Monday, April 9, 12

Conversation with Rea

- *Mike approaches screen and Rea turns to face him and says:*
- Hello. How can I help you?
- Mike: I'm looking to buy a place near MIT.
- *Rea nods, indicating she is following.*
- Rea: I have a house to show you. (picture of a house appears on the screen)
- Rea: it is in Somerville.
- Mike: Tell me about it.
- *Rea looks up and away while she plans what to say.*
- Rea: It's big.
- *Rea makes an expansive gesture with her hands.*
- *Mike brings his hands up as if to speak, so Rea does not continue, waiting for him to speak.*
- Mike: Tell me more about it.
- Rea: Sure thing. It has a nice garden...

Virtual agents

- What do the virtual agents do?
- Do they elicit an emotional response in you?
- Do you trust them?
- What is the style of interaction?
- What facial expression do they have?
- Are they believable, pushy, helpful?
- Would it be different if they were male? If so, how?

Monday, April 9, 12

What makes a virtual agent believable?

- Believability refers to the extent to which users come to believe an agent's intentions and personality

- Appearance is very important
  - Are simple cartoon-like characters or more realistic characters, resembling the human form more believable?

- Behavior is very important
  - How an agent moves, gestures and refers to objects on the screen
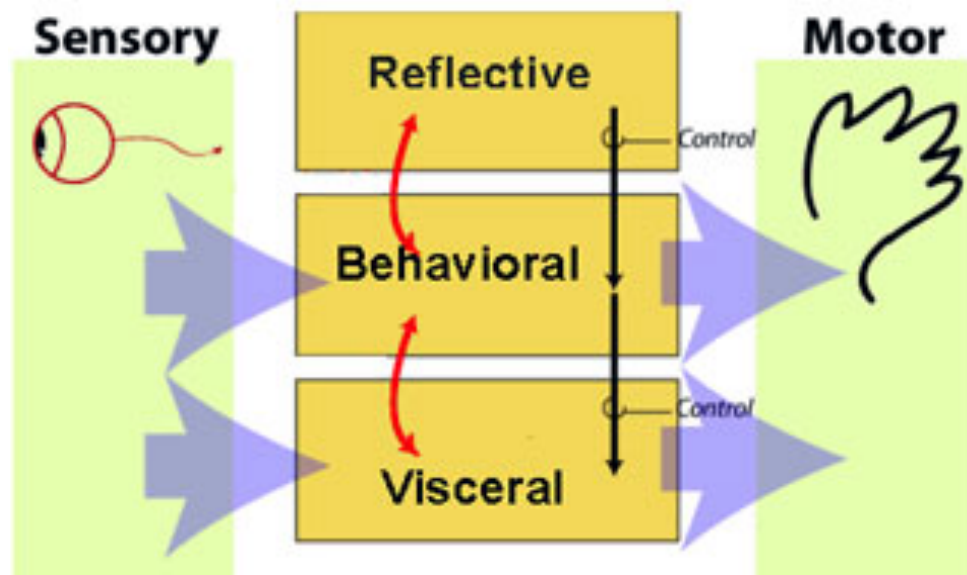 - Exaggeration of facial expressions and gestures to show underlying emotions (c.f. animation industry)

Monday, April 9, 12

Robot-like or cuddly?

- Which do you prefer and why?

Monday, April 9, 12
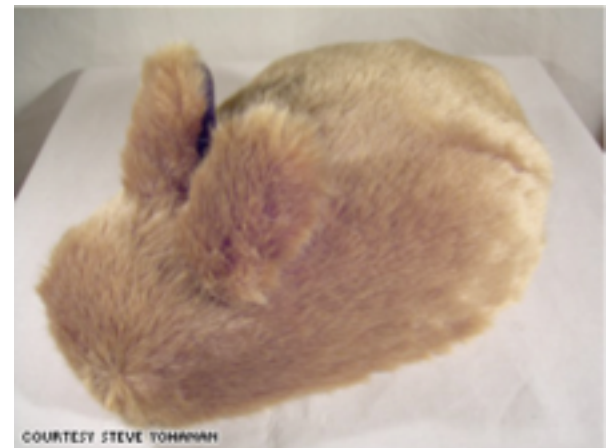
Emotional design model

- Norman, Ortony and Revelle (2004) model of emotion

Monday, April 9, 12

Claims from model

- Our emotional state changes how we think
  - when frightened or angry we focus narrowly and body responds by tensing muscles and sweating
    - more likely to be less tolerant
  - when happy we are less focused and the body relaxes
    - more likely to overlook minor problems and be more creative

Monday, April 9, 12

Implications

- Should we, therefore, create products that adapt according to people's different emotional states?
  - When people are feeling angry should an interface be more attentive and informative than when they are happy?

- Is Norman right?
  - designers "can get away with more" for products intended to be used during leisure time than those designed for serious tasks

Monday, April 9, 12

Pleasure model

- Jordon (2000) based on Tiger's (1992) framework of pleasure
- Focuses on the pleasurable aspects of our interactions with products
  - (i) physio-pleasure
  - (ii) socio-pleasure
  - (iii) psycho-pleasure
  - (iv) ideo-pleasure (cognitive)
- Means of framing a designer's thinking about pleasure, highlighting that there are different kinds

Monday, April 9, 12

Technology as Experience

- McCarthy and Wright (2004) framework of the user experience in terms of how it is 'felt' by the user

- Draws from Pragmatism, which focus on the sense-making aspects of human experience

- Made up of 4 core threads
  - compositional,
  - sensual,
  - emotional
  - spatio-temporal

Summary

- Emotional interaction is concerned with how interactive systems make people respond in emotional ways

- Well-designed interfaces can elicit good feelings in users

- Expressive interfaces can provide reassuring feedback

- Badly designed interfaces make people angry and frustrated

- Anthropomorphism is the attribution of human qualities to objects

- An increasingly popular form of anthropomorphism is to create interface agents and robot pets

- Models of affect provide a way of conceptualizing emotional and pleasurable aspects of interaction design

Monday, April 9, 12