

IT 4255 Human-Computer Interaction

The Course Description

- Surveys Human-computer Interaction Concepts, Theory, and Practice,
- Focusing on Its Interdisciplinary Nature.
- It Describes the Principles of Human-computer Interaction and the Practice of User Interface Design.
- It Also Discusses the Major Human Information Processing Sub-systems (Perception, Memory, Attention, and Problem-solving) and Introduces Usability Metrics and Evaluation Methods

My Background

- Educational background
- Over 35 Years Teaching at Northeastern in Both Day, Evening and Graduate
- 9 Years Training Senior Citizens
- Over 40 Years of Working in Information Technology
- Worked on PeopleSoft Financials
- Prototyped Hand Held Application With a Web Portal

Open Communication

- View Teaching In Terms Of Traffic You Realize Very Quickly That It Is Not A One-Way Street
- Needs to Be Enjoyable and Useful Experience

Course Introduction

- Syllabus Book Project Teams Familiarity and Evaluation or Comments
- Fill Out The Questionnaire

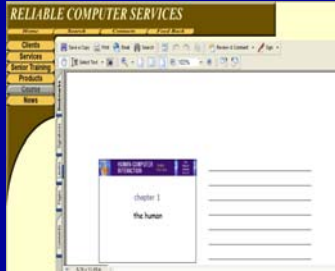
Web Page www.Reliable-Computer.com

- Clients
- Services
- Senior Training
- Products
- Course
- News



Course Button

- PowerPoint Presentation For Each Class
- Double Click to Bring up Adobe Acrobat Reader
- Print Three On Page PowerPoint Slides



Senior Training

- Some Of The Various Things That Are Unique To Seniors
 - Links to Web Sites
 - Photo Gallery
 - Training Report
 - Double Click to Bring up Adobe Acrobat Reader



Product Tab

- Use of Handheld Palm
- Rover MYSQL Version
- Use of Palm or Portable PC Known AS The Rover System



History of Human Computer Interaction

- Human Factors
- Ergonomics

History of Human Computer Interaction

- Study of Interaction Between People (Users) and Computers.
- An Interdisciplinary Subject Relating Computer Science With Many Other Fields of Study and Research.
- Interaction Between Users and Computers Occurs at the User Interface (or Simply Interface), Which Includes Both Software and Hardware

Human-computer Interaction (HCI) ,

- Alternatively **Man-machine Interaction (MMI)**
- **Computer-human Interaction (CHI)**

Man-machine Interaction (MMI)

- Used to Refer to Any Man-machine Interaction, Including, but Not Exclusively Computers.
- The Term Was Used Early on in Control Room Design for Anything Operated on or Observed by an Operator, E.G. Dials, Switches, Knobs and Gauges.
- Industrial Engineering - Work Simplification

Computer-human Interaction (CHI)

- Used to Refer to This Field, Perhaps More Frequently in the Past Than Now.
- However, Researchers and Practitioners Now Refer to Their Field of Study As HCI (Pronounced As an Initialism),
- Rose in Popularity Partly Because of the Notion That the Human, and the Human's Needs and Time, Should Be Considered First, and Are More Important Than the Machine's.

Human-centered Computing

- Emerged With an Even More Pronounced Focus on Understanding Human Beings As Actors Within Socio-technical Systems.

HCI Differs With Human Factors

- More of a Focus on Users Working With *Computers* Rather Than Other Kinds of Machines or Designed Artefacts
- Additional Focus on How to Implement the (Software and Hardware) Mechanisms Behind Computers to Support Human-computer Interaction.

HCI Also Differs With Ergonomics

- Less of a Focus on Repetitive Work-oriented Tasks and Procedures, and Much
- Less Emphasis on Physical Stress and the Physical Form or Industrial Design of Physical Aspects of the User Interface, Such As the Physical Form of Keyboards and Mice.

Human-Computer Interaction Introduction

- Professional Practitioners in HCI Are Usually Designers Concerned With the Practical Application of Design Methodologies to Real-world Problems.
- Their Work Often Revolves Around Designing Graphical User Interfaces and Web Interfaces

Human-Computer Interaction

Combining Aspects of Several Major Fields

Computer Science - for Ideas Concerning How to Design Algorithms

Psychology and Related Fields - for Knowledge Concerning the Capabilities of Human Memory, Motor Skills, and Perception; How People Communicate With Each Other and Work in Groups; And Social Dynamics

• **Artificial Intelligence** and Related Fields - for Ideas Concerning How to Automate More Work, or Make Computers That Behave More Like Intelligent Assistants

Computer Graphics - for Ideas Concerning How to Output Visual Information
Design - for Example, Graphic Design of Visual Output, Industrial Design of Mice and Keyboards, Etc

Interactive Design

- Develop Interactive Systems That Are Useable
- Easy to Learn
- Provide an Enjoyable User Experience

Commandments of User Interface Design

- Understand Your Users and Their Tasks
- Involve the User in Interface Design
- Test the System on Actual Users
- Practice Iterative Design.

Human Engineering Guidelines

- The User Should Always Be Aware of What to Do Next.
- Tell User What the System Expects Right Now.
- Tell User That Data Has Been Entered Correctly.
- Tell User That Data Has Not Been Entered Correctly.
- Explain Reason for a Delay in Processing.
- Tell User a Task Was Completed or Not Completed.

Human Engineering Guidelines (continued)

- Format Screen So Instructions and Messages Always Appear in the Same General Display Area
- Display Messages and Instructions Long Enough So User Can Read Them.
- Use Display Attributes Sparingly.
- Default Values Should Be Specified.
- Anticipate Errors Users Might Make.

Human Engineering Guidelines (continued)

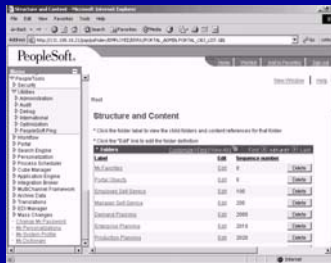
- Users Should Not Be Allowed to Proceed Without Correcting an Error.
- If User Does Something That Could Be Catastrophic, the Keyboard Should Be Locked to Prevent Any Further Input, and an Instruction to Call the Analyst or Technical Support Should Be Displayed.

Guidelines for Dialogue

- The Overall Flow Of Screens And Messages For An Application
- Tone:
 - Use Simple, Grammatically Correct Sentences.
 - Don't Be Funny Or Cute!
 - Don't Be Condescending.
- Terminology
 - Don't Use Computer Jargon.
 - Avoid Most Abbreviations.
 - Use Simple Terms.
 - Be Consistent In Your Use Of Terminology.
 - Carefully Phrase Instructions
 - Use Appropriate Action Verbs.

Web Interfaces (Web Portal)

- PeopleSoft Navigation
- Internet Solutions
 - Universal Access Through Web Browser
 - Enhanced Self-services Web Functionality
 - Role-based Transactions



Graphical User Interfaces (Form/Menu)



Chapter 1 Deals With The Human Aspect

- Types Of Users
 - Expert
 - Novice
 - Causal Users
 - Senior Citizens and Users With Disabilities

Chapter 1 The Human

Humans Are Limited in Their Capacity to Process Information. This Has Important Implications for Design.

Information Is Received and Responses Given Via a Number of Input and Output Channels:

- Visual Channel
- Auditory Channel
- Haptic Channel
 - Haptic technology refers to technology which interfaces the user via the sense of touch by applying forces, vibrations and/or motions to the user
- Movement

Chapter 1 The Human

Information Is Stored in Memory:

- Sensory Memory
- Short-term (Working) Memory
- Long-term Memory

Chapter 1 The Human

Information is processed and applied:

- Reasoning
- problem solving
- skill acquisition
- error

Chapter 1 The Human

Emotion Influences Human Capabilities.
Users Share Common Capabilities but
Are Individuals With Differences, Which
Should Not Be Ignored.

Chapter 1 The Human Slides

Chapter 2 Deals With The Computer Aspect

- Input Types
 - Mouse And Keyboard
 - Voice
 - OCR
 - Graffiti
 - Handheld
 - Web Portal
 - VB Form Using Access
- EXERCISE 2.2

CHAPTER 2 The Computer

A Computer System Comprises Various Elements, Each of Which Affects the User of the System.

CHAPTER 2 The Computer

Input Devices for Interactive Use, Allowing Text Entry, Drawing and Selection From the Screen:

Text Entry:

Traditional Keyboard, Phone Text Entry, Speech and Handwriting

Pointing:

Principally the Mouse, but Also Touch Pad, Stylus, and Others

3D Interaction Devices

CHAPTER 2 The Computer

Output Display Devices for Interactive Use:

- Different Types of Screen Mostly Using Some Form of Bitmap Display
- Large Displays and Situated Displays for Shared and Public Use
- Digital Paper May Be Usable in the Near Future

CHAPTER 2 The Computer

Virtual Reality Systems and 3D Visualization Have Special Interaction and Display Devices.

- #### Various Devices in the Physical World:
- Physical Controls and Dedicated Displays
 - Sound, Smell and Haptic Feedback
 - Sensors for Nearly Everything Including Movement, Temperature, Bio-signs

CHAPTER 2 The Computer

Paper Output and Input: the Paperless Office and the Less-paper Office:

- Different Types of Printers and Their Characteristics, Character Styles and Fonts
- Scanners and Optical Character Recognition

CHAPTER 2 The Computer

Memory:

Short-term Memory: RAM

Long-term Memory: Magnetic and Optical
Disks

Capacity Limitations Related to Document
and Video Storage

Access Methods As They Limit or Help the
User

CHAPTER 2 The Computer

Processing:

The Effects When Systems Run Too Slow or
Too Fast,

The Myth of the Infinitely Fast Machine
Limitations on Processing Speed

Networks and Their Impact on System
Performance.

CHAPTER 2 The Computer Slides
