

Introduction

Human Computer Interaction

Based on slide deck

Part 1. Introduction

Human Computer Interaction I: Principles and Design

by

Saul Greenberg

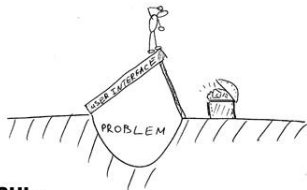
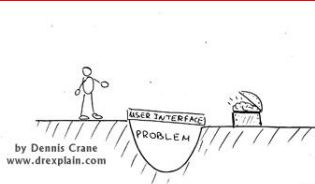
Professor

University of Calgary, Canada

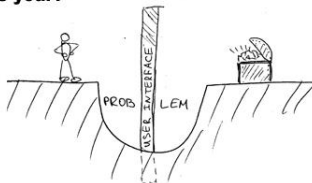
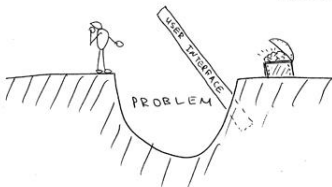
*The new slides are marked with a **

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*Human Computer Interaction



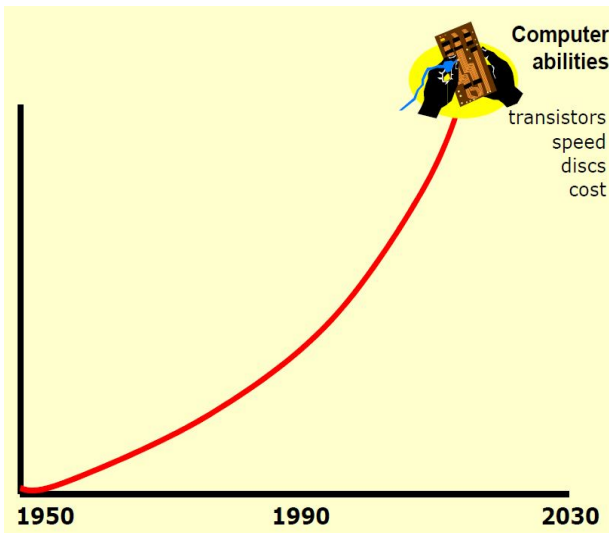
Software GUI...
Which one is your?



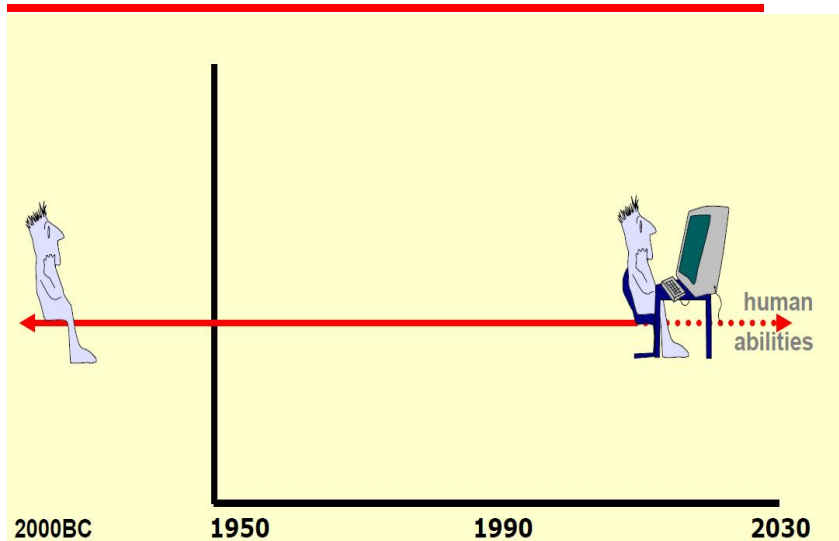
Human Computer Interaction



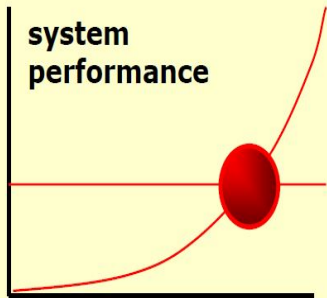
Moore's Law



Psychology



Where is the bottleneck?



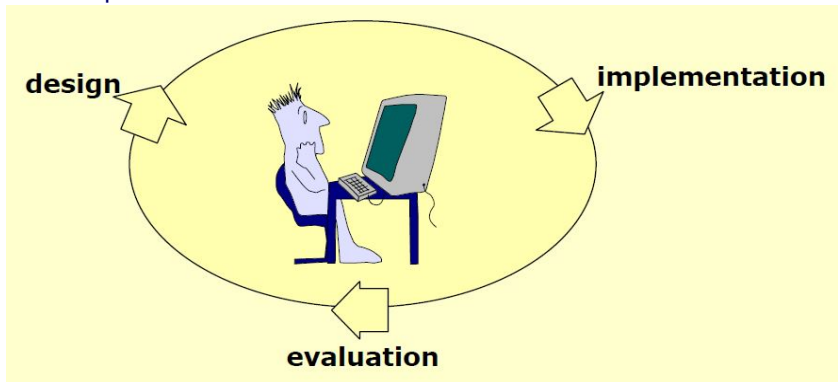
***Definition of Human Computer Interaction**

Human-computer interaction is a discipline concerned with the design, evaluation and implementation of interactive computing systems for human use and with the study of major phenomena surrounding them.

ACM SIGCHI Curricula for Human-Computer Interaction

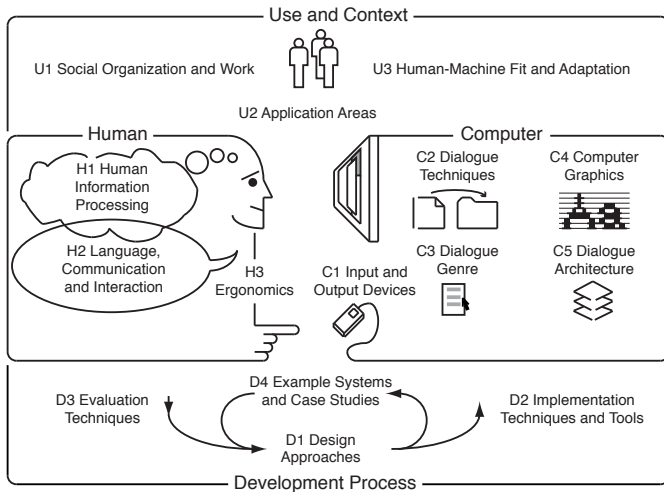
Definition of Human Computer Interaction

A discipline concerned with the



of interactive computing systems for human use

*Definition of Human Computer Interaction



*Human Computer Interaction

The cardinal axiom of all user interface design:

A user interface is well-designed when the program behaves exactly how the user thought it would.

All the other rules of good UI design are just corollaries.

Joel Spolsky, Controlling Your Environment Makes You Happy,
Joel on Software

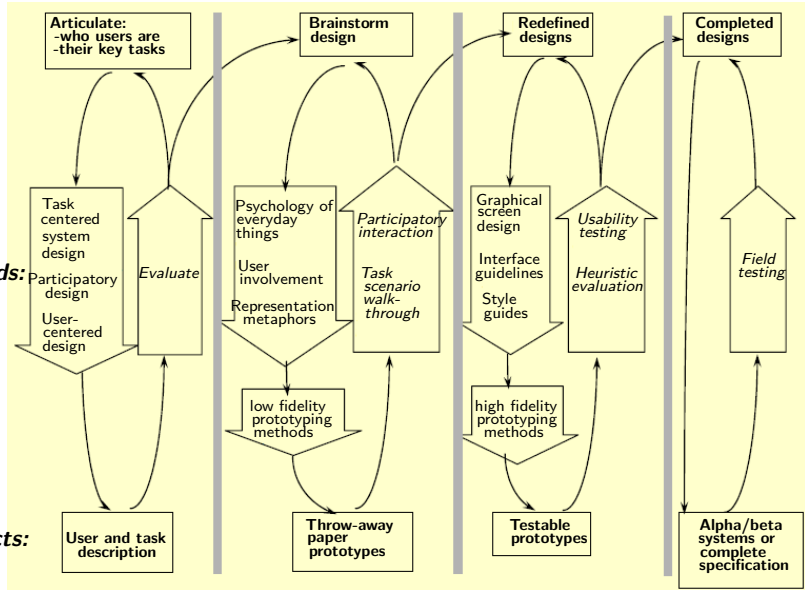
[https://www.joelonsoftware.com/2000/04/10/
controlling-your-environment-makes-you-happy/](https://www.joelonsoftware.com/2000/04/10/controlling-your-environment-makes-you-happy/)

An interface design process

Goals:

Methods:

Products:



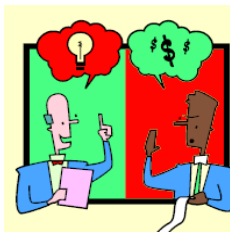
Why an interface design process?

63% of large software projects go over cost

- managers gave four usability-related reasons
 - users requested changes
 - overlooked tasks
 - users did not understand their own requirements
 - insufficient user-developer communication and understanding

Usability engineering *is* software engineering

- pay a little now, or pay a lot later!
- far too easy to jump into detailed design that is:
 - founded on incorrect requirements
 - has inappropriate dialogue flow
 - is not easily used
 - is never tested until it is too late



Foundations for designing interfaces

Understanding users and their tasks

- Task-centered system design
 - how to develop task examples
 - how to evaluate designs through a task-centered walk-through

Designing with the user

- User centered design and prototyping
 - methods for designing with the user
 - low and medium fidelity prototyping
- Evaluating interfaces with users
 - the role of evaluation in interface designs
 - how to observe people using systems to detect interface problems



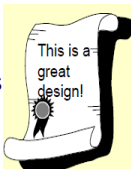
Foundations for designing interfaces

Designing visual interfaces

- Design of everyday things
 - what makes visual design work?
- Beyond screen design
 - representations and metaphors
- Graphical screen design
 - the placement of interface components on a screen

Principles for design

- Design principles, guidelines, and usability heuristics
 - using guidelines to design and discover usability problems



Objectives

At the end of this course, you will know

- methods for grounding your design in reality
- methods for prototyping visual applications
- methods for evaluating interface quality
- fundamentals of screen design and representations
- how to apply guidelines to interface designs
- how to apply your training in practice and continue your education



How you will be evaluated

Assignment 1

- task centered design and prototyping (50%/3)

Assignment 2

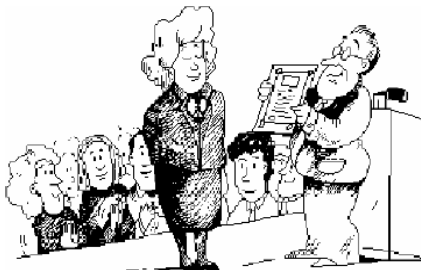
- usability evaluation of an existing system (50%/3)

Assignment 3

- system (re-)design,
implementation
and critique (50%/3)

Exam (50%)

*To pass the course
one must pass the exam
and each of the assignments*



Labs

Critical to your success in assignments

- elaboration of details
- learn specific skills
- discuss intermediate results
- class feedback on assignment milestones



*(G)UI Design versus (G)UI Development/Programming

- ▶ desktop GUI programming in C#
 - ▶ **Windows Forms**
 - ▶ **WPF** (Windows Presentation Foundation)
 - ▶ XAML based
 - ▶ **UWP** (Universal Windows Platform)
 - ▶ XAML based
 - ▶ Windows 10 and Windows 10 Mobile
- ▶ web GUI programming in C#
 - ▶ **ASP.NET Web Forms**
 - ▶ **ASP.NET MVC / ASP.NET Core MVC**

*(G)UI Design versus (G)UI Development/Programming

- ▶ GUI programming in Java
 - ▶ **AWT API** (Abstract Windowing Toolkit) (mostly obsolete)
 - ▶ **Swing API**
 - ▶ **JavaFX** (meant to replace Swing)
- ▶ Android UI programming

*(G)UI Builders

- ▶ Visual Studio 2017 **Windows Forms Designer**
- ▶ Visual Studio 2017 **XAML Designer**
- ▶ NetBeans GUI Builder (AWT/Swing)
- ▶ Eclipse GUI Builder (Swing)
- ▶ Android Studio **Layout Editor**
- ▶ ...

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