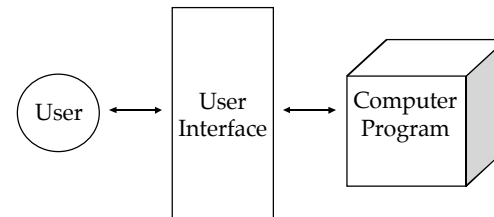# CSE 3461: Module 1

Overview of User Interfaces

What is the User Interface (UI)? (1)

The simple view:

The user interface is the junction between the user and the computer

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What is the User Interface (UI)? (2)

- The simple view is consistent with the perspectives of (some) designers and developers:
  - Application functionality can be abstracted away from UI
  - UI and "back-end" are often developed separately
  - "Back-end" often more of a focus
  - UI even seen as an add-on

Code, Cost, and Effort

- UI is about 60% of the total code
- The UI is minimally 29% of the software development project budget
- The UI may take as much as 40% of the development effort

Software Lifecycle

- Pre-release software development is but one phase of software lifecycle.
  - Review of phases of s/w development: requirements analysis, design specification, implementation, testing
- 80% percent of software lifecycle costs occur after the product is released, in the maintenance phase
  - Of that work, 80% is due to unmet or unseen user requirements
  - Only 20% of this is due to bugs or reliability problems

Karat, C. Usability engineering in dollars and cents. *IEEE Software*, May 1993, p 89.

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What is the User Interface (UI)? (3)

- User vs Designer: different perspectives
- The user:
  - sees application as a whole; no distinction between the UI and other components
  - has tasks to perform; doesn't care about back-end components
- What is the consequence of this perspective?
  - Critical link: If the UI is well designed and usable, then entire application is usable
  - Corollary: if the UI is poor, then the entire application is unusable, even if the other components have been designed well.

Credo: The interface IS the application! 6

What is the User Interface (UI)? (4)

Aspects of the system that affords interaction with users:
  - the use of a conceptual model
  - knowledge mapping (how UI objects correspond to objects in the real world)
  - the use of metaphors (used to help the user, such as the "desktop")
  - controls (widgets) and their behaviour
  - techniques for navigation within a display
  - techniques for establishing continuity between different types of displays (e.g., flow between displays)
  - techniques for integrating multiple different applications
  - display design
    - visual design of screen (graphical design)
    - "auditory display" acoustic cues
    - haptic feedback

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What is the User Interface (UI)? (5)

- The UI is much more than a layer slapped between the user and the computer
- Need an appreciation of:
  - the user
    - how do they vary?
  - the task(s) (and their flow)
    - what are they? what strategies will users employ?
  - the environment in which the task is performed
    - how will it vary and what effects will this have on the interaction?

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Disciplines Relevant to HCI

Human aspects:
- Anthropometrics
- Cognitive psychology
- Communication theory
- Graphic and industrial design
- Ergonomics and human factors
- Linguistics and pragmatics
- Social and organizational psychology
- Sociology and anthropology

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Disciplines Relevant to HCI

Computational aspects:
- Computer science (operating systems, programming languages)
- Software engineering
- Computer graphics
- Software development environments and tools
- Artificial intelligence
- Computational linguistics (discourse and dialog management)

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