CTT534 – Thiết Kế Giao Diện

Graphic Design – Part 1

14/4/2017

Outline

- Graphic design
- Affordance
- Affordance in HCI design
- Visible constraints

Graphic design

- **Graphic design**: refers to artistic and professional disciplines which focus on *visual communication* and *presentation*

- In UI, it refers the *look and feel* portion of an interface
    - initially encountered by users
        - eye catching
    - conveys an impression, mood, beauty, etc.
    - facilitates finishing the task at hand
    - suggests trust

What are these items?

Affordance

- "**Perceived** and **actual** properties of a thing that determine how the thing could be used" – *Don Norman*

- An **affordance** is a quality of an object that allows an individual to perform an action
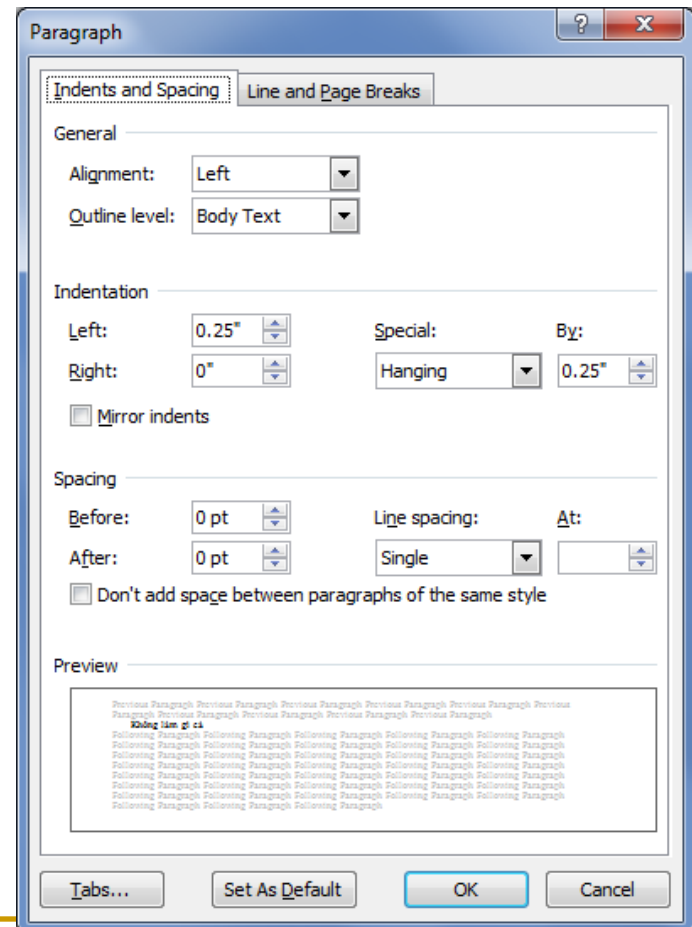 - Related to **look and feel** of an object

Affordance (cont'd)

- **Two types of affordance**
  - Perceived affordance
    - design invites people to take possible actions
  - Actual affordance
    - the actual actionable properties of the product

Perceived affordance

- Is the perceived properties of the object that suggest how we could use it
  - buttons for pressing
  - switches for toggling

Perceived affordance (cont'd)
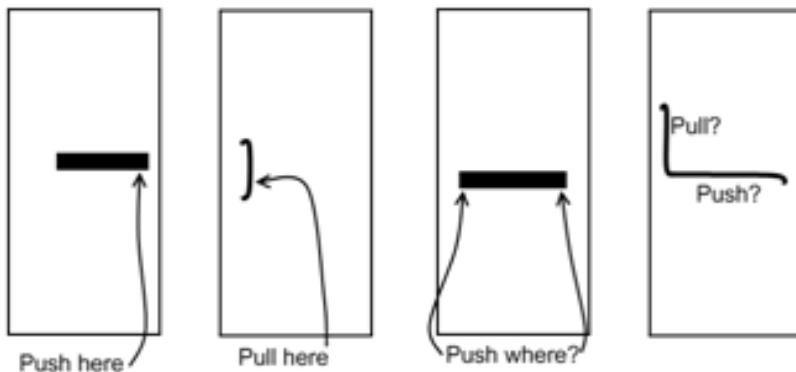
- Poor affordances
  - Pull or Push?

Perceived affordance (cont'd)

- Affordance can be dependent on
  - Experience
  - Knowledge
  - Culture of users

Perceived affordance (cont'd)

- Door handle – a classic affordance problem

- Vertical bar → pull
- Horizontal bar or flat surface → push
- Knob or handle → grab and twist
- Bar or handle location
→ door opens to the left or right

Perceived affordance (cont'd)

- Affordance can be dependent on the
  - Context
  - Layout
  - Locations of the objects placed

Perceived affordance (cont'd)

- Perceived affordance (perception) can differ from real affordance
  - the paper-made chair has a perceived affordance for sitting
  - but it doesn't actually afford sitting: it collapses under your weight

Paper-made chairs

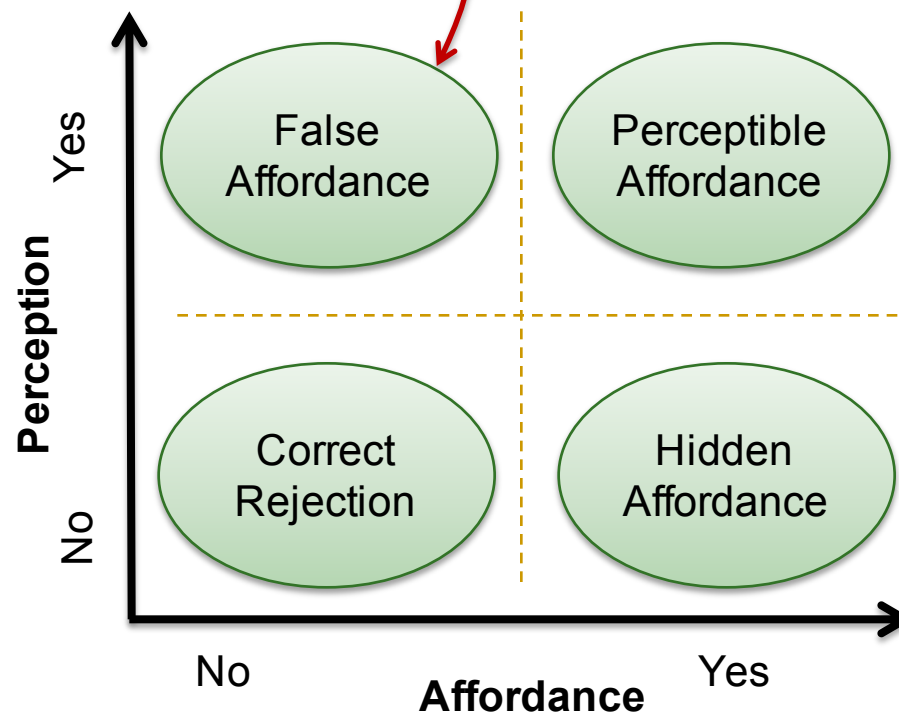# Perceived and real affordance

- Affordance
    - Perceived affordance (perception)
        - design invites people to take possible actions
    - Actual affordance
        - the actual actionable properties of the product

- Problems occur when
    - these are not the same
   - people's perceptions are not what the designer expects

Perceived and actual affordance (cont'd)

- A **false affordance** exists when there is no action offered but the information that specifies it is
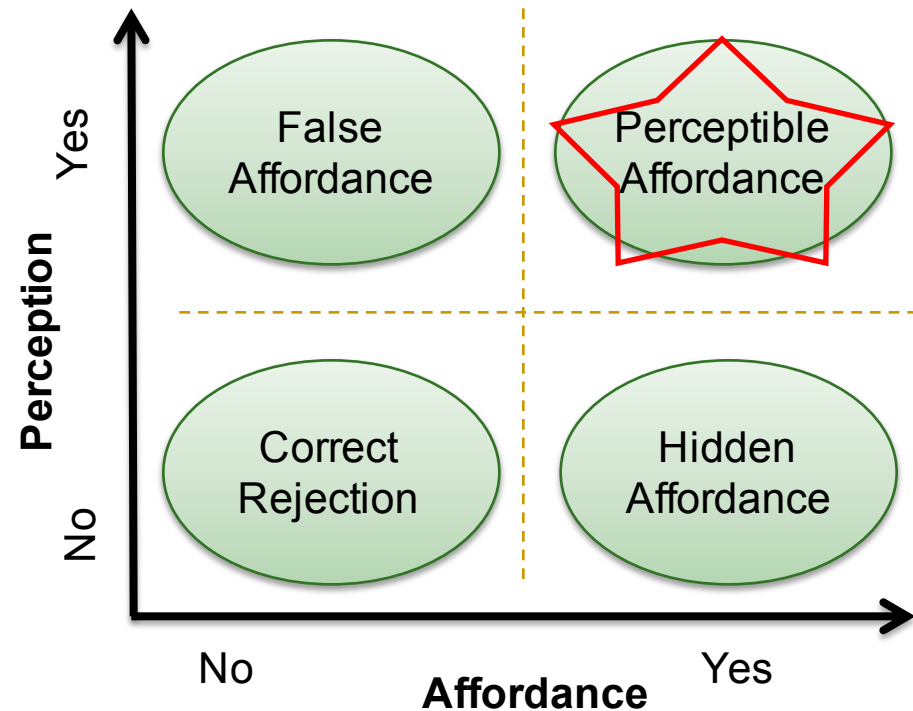 - E.g., paper-made chairs

Perceived and actual affordance (cont'd)

- A **false affordance** exists when there is no action offered but the information that specifies it is
  - ❑ E.g., paper-made chairs
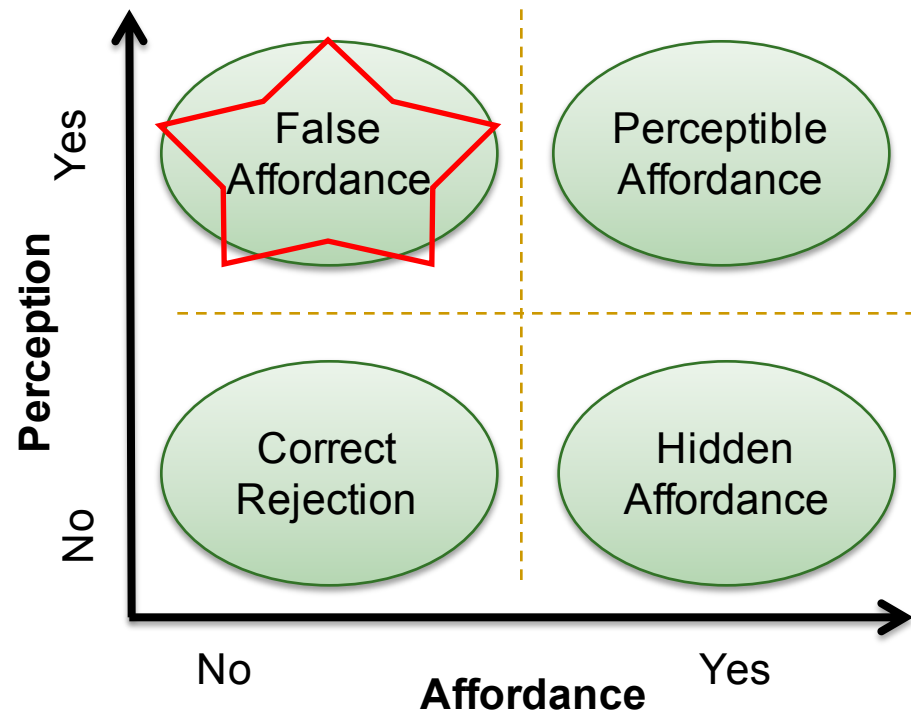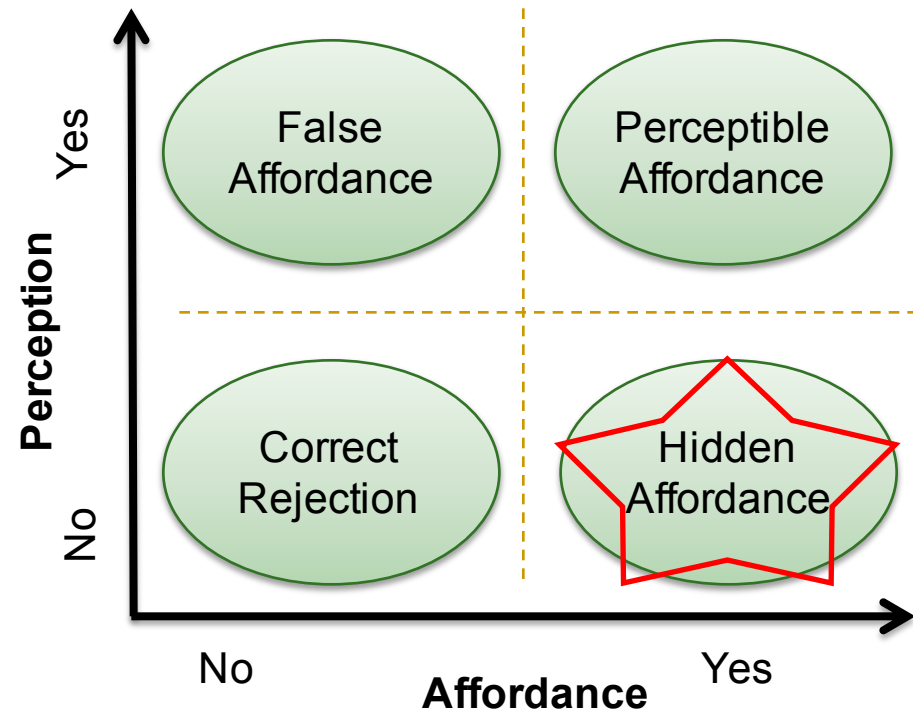
Perceived and actual affordance (cont'd)

- **Perceptible affordance – real affordance**

	Affordance No	**Affordance** Yes
Perception Yes	False Affordance	Perceptible Affordance
Perception No	Correct Rejection	Hidden Affordance

Perceived and actual affordance (cont'd)

- **Hidden affordance**

camera

	Affordance	
Perception Yes	False Affordance	Perceptible Affordance
No	Correct Rejection	Hidden Affordance
	No	Yes

Perceived and actual affordance (cont'd)

- **Correct rejection**
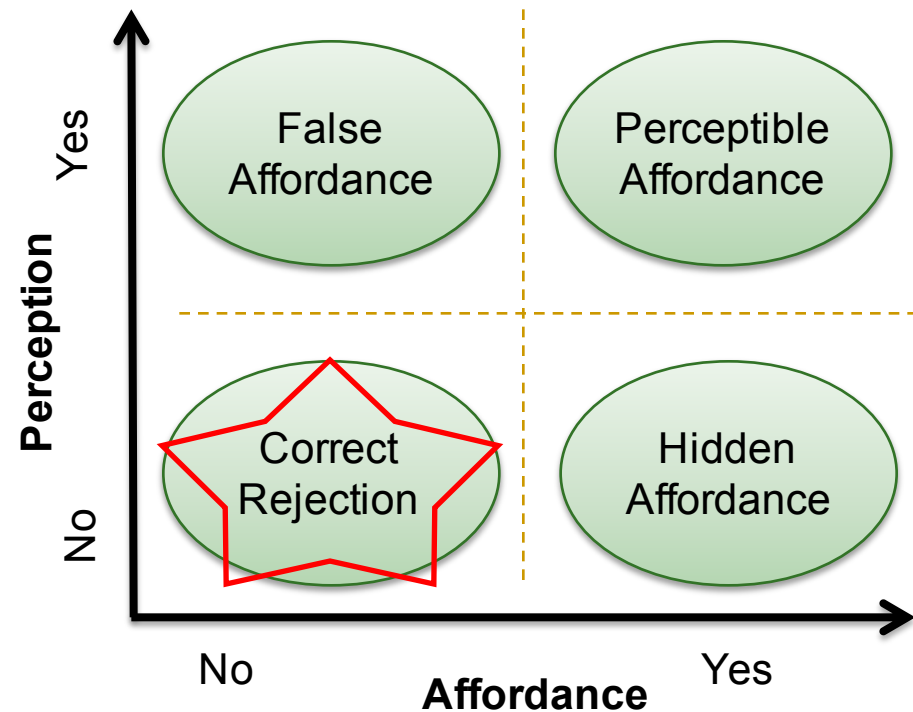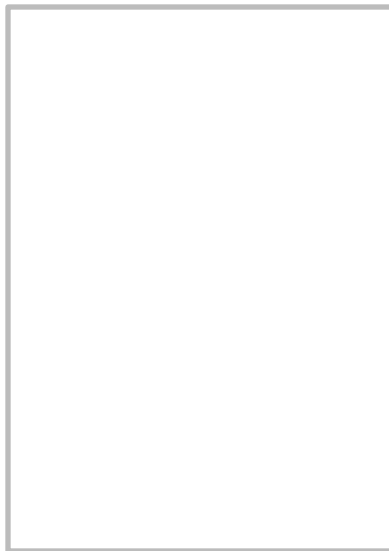
Signifiers

- An **affordance** is a quality of an object that allows an individual to perform an action

- A **signifier** is a thing that communicates the affordance of an object

- A signifier can be labels, instructions, shapes, colors, layouts, sound, videos, animations, mouse shapes, etc.

Signifiers (cont'd)

- What are signifiers in the following?
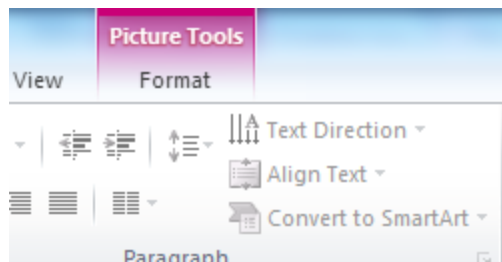
Affordance in HCI design

Affordance in HCI design (cont'd)

- In HCI, interfaces are virtual and do not have affordances like physical objects

- It does not make sense to talk about interfaces in terms of 'real' affordances - *Norman*

- Interfaces are better conceptualized as 'perceived' affordances

- In graphical, screen-based interfaces, the designer can control over perceived affordances

  - Display screen, pointing device, selection buttons, keyboard

  - Actions including touching, pointing, looking, clicking on every pixel of the display
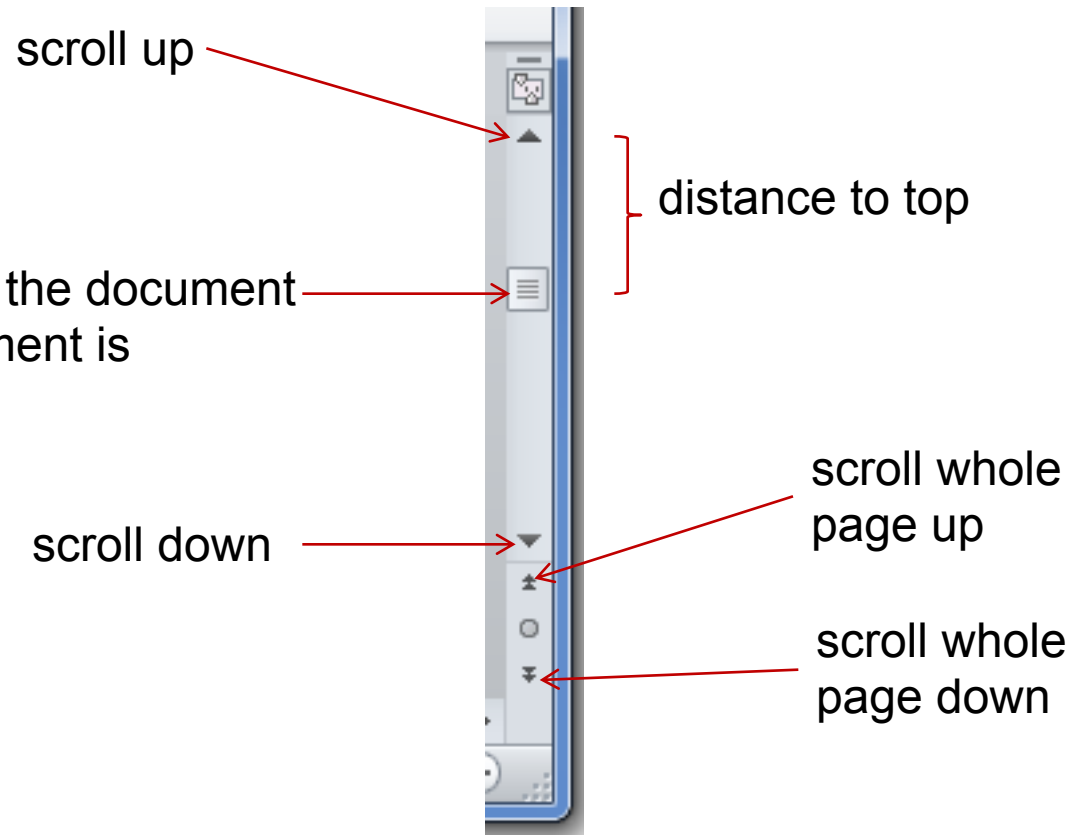
Affordance in HCI design (cont'd)

- ## GUI design
  - ❑ perception only through visuals
  - ❑ designer creates appropriate visual affordances via
    - ■ familiar idioms
    - ■ metaphors

Affordance in HCI design (cont'd)

- Windows' scrollbar affordance (MS Word)

scroll up

distance to top

- current position in the document
- how big the document is

scroll whole
page up

scroll down

scroll whole
page down

Affordance in HCI design (cont'd)

- Cognitive considerations
  - Perceived affordances
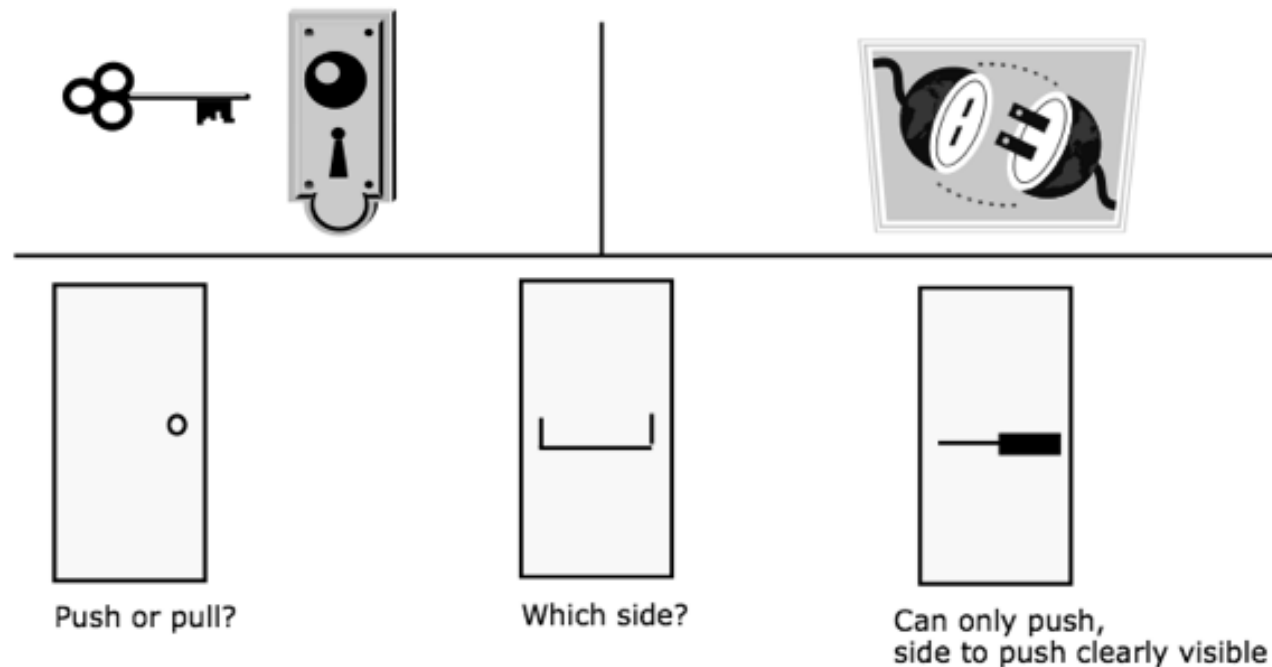 - → Constraints
  - Feedback
  - Mapping
  - Mental Models
  - Conceptual models

Source: Don Norman's book, *The Psychology of Everyday Things*

Visible constraints

- Limitations of the actions possible perceived from object's appearance
    - provides people with a range of usage possibilities

Push or pull?

Which side?

Can only push, side to push clearly visible

Visible constraints (cont'd)

- The more constraints, the less opportunity for error
    - particularly important for managing user input

Visible constraints (cont'd)

- **Benefits**
 - Restricting user actions to valid actions
  - Helps prevent from selecting incorrect options
  - Eliminate need for perfect knowledge
  - Recognition over recall

- **The more constraints, the less opportunity for error**
  - But too much constraint, less flexible and less efficient
  - E.g., Expert users prefer typing than clicking to select choices

Visible constraints (cont'd)

- Constraints vs. flexibility and efficiency
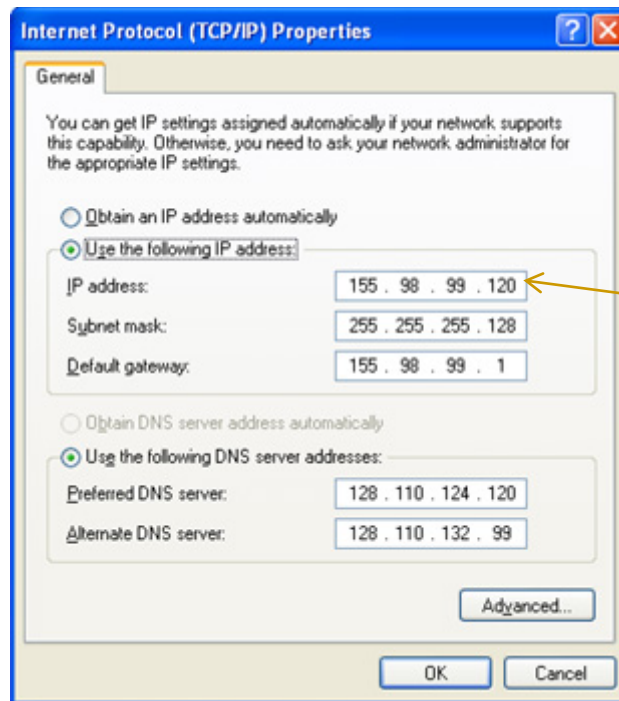
One has to click to set focus to enter IP at each part
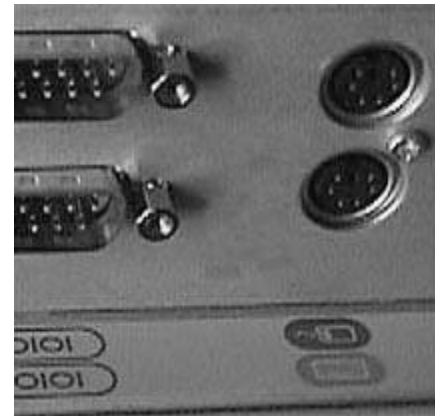
Visible constraints (cont'd)

- Three main types (Norman, 1999)
  - physical
  - cultural
  - Logical

- Physical constraints
  - refer to the way physical objects restrict the movement of things
  - E.g. how many ways can you insert a CD or DVD disk into a computer?

Visible constraints (cont'd)

- **Logical constraints**
  - Exploit people's everyday common sense reasoning about the way the world works
  - E.g., the logical relationship between physical layout of a device and the way it works

Visible constraints (cont'd)

- **Cultural constraints**
  - Groups of people learn idioms
    - red = danger, green = go
  - But these differ in different places, e.g.,
    - Colors
      - Red is not at all danger (preferable) in many countries
    - Light switches
      - America: down is off
      - Britain: down is on
    - Faucets
      - America: counter-clockwise is on

Summary of topics

- Graphic design

- Affordance

- Affordance in HCI design

- Visible constraints