Questions?

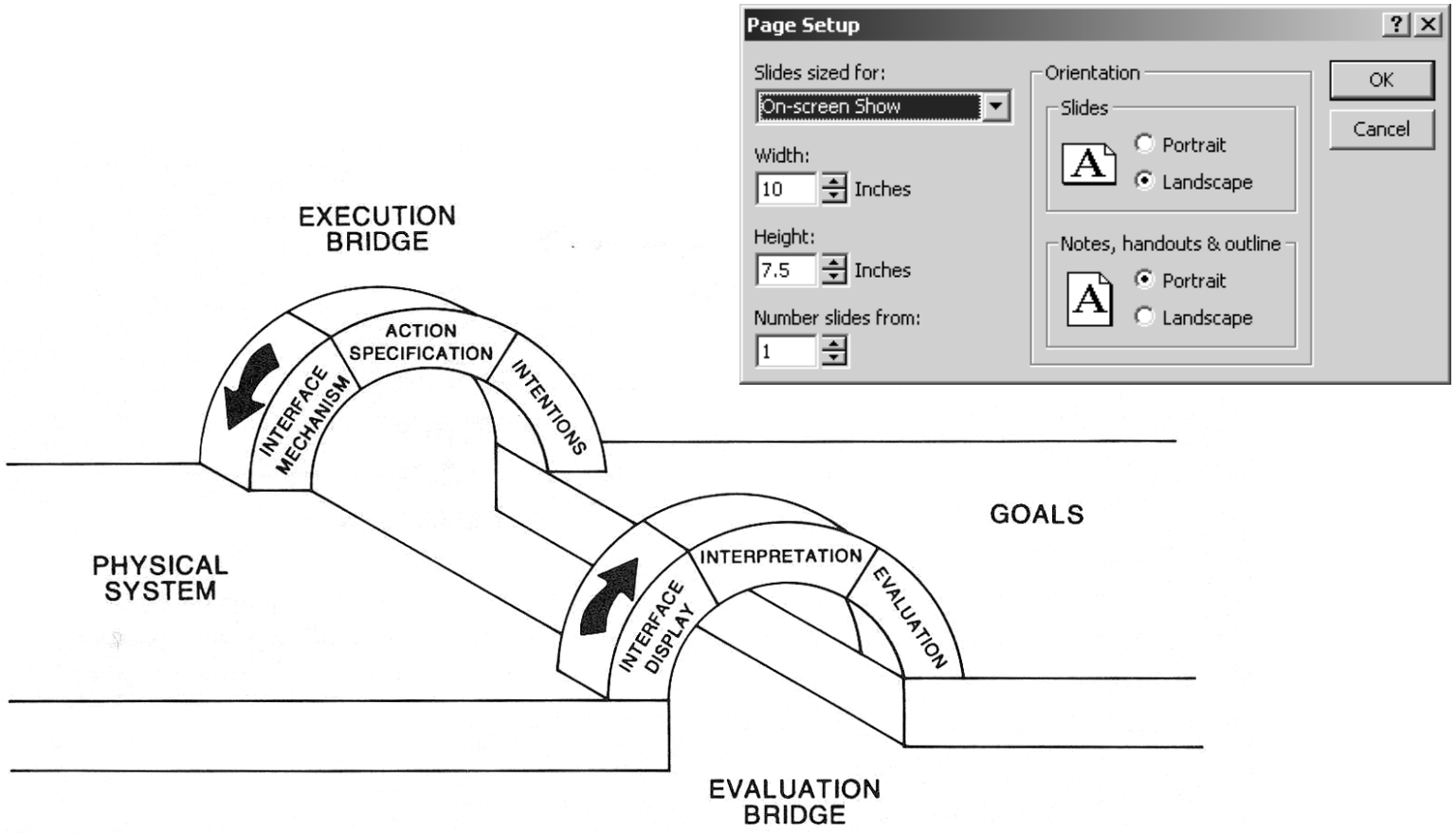
- Project #2
- HW#3 due today

Survey

- Homework
  - Length
  - Interaction with project
- Reading
  - Distribution over time
  - Textbook
- Applications
  - Real world product examples
- Class participation
  - Frequent participants
- Confusing
  - Models

Cognitive engineering

- Gulfs of execution and evaluation [Norman 86]

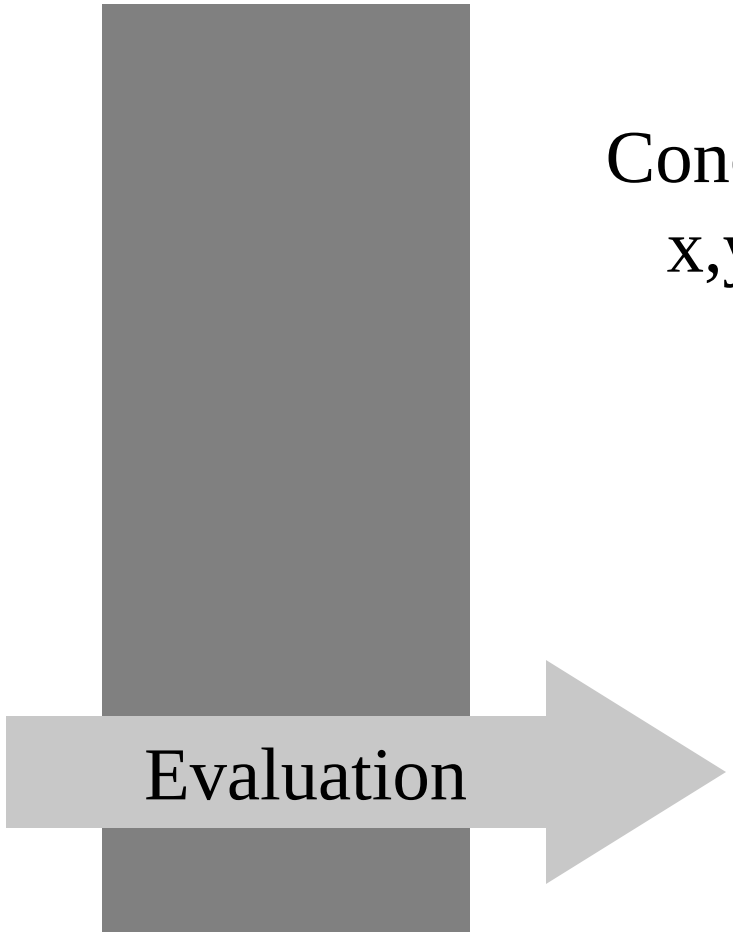


Gulf of evaluation: statistical analysis (1)

Gulf

Real world:

X	Y
0.67	0.79
0.32	0.63
0.39	0.72
0.27	0.85
0.71	0.43
0.63	0.09
0.03	0.03
0.20	0.54
0.51	0.38
0.11	0.33
0.46	0.46

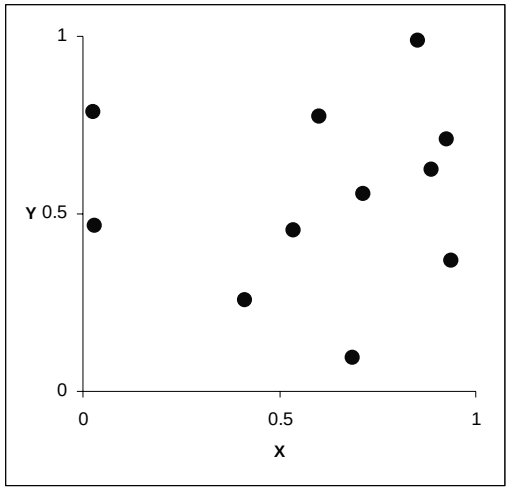


Conceptual model:
x,y correlated?

Gulf of evaluation: statistical analysis (2)

Gulf

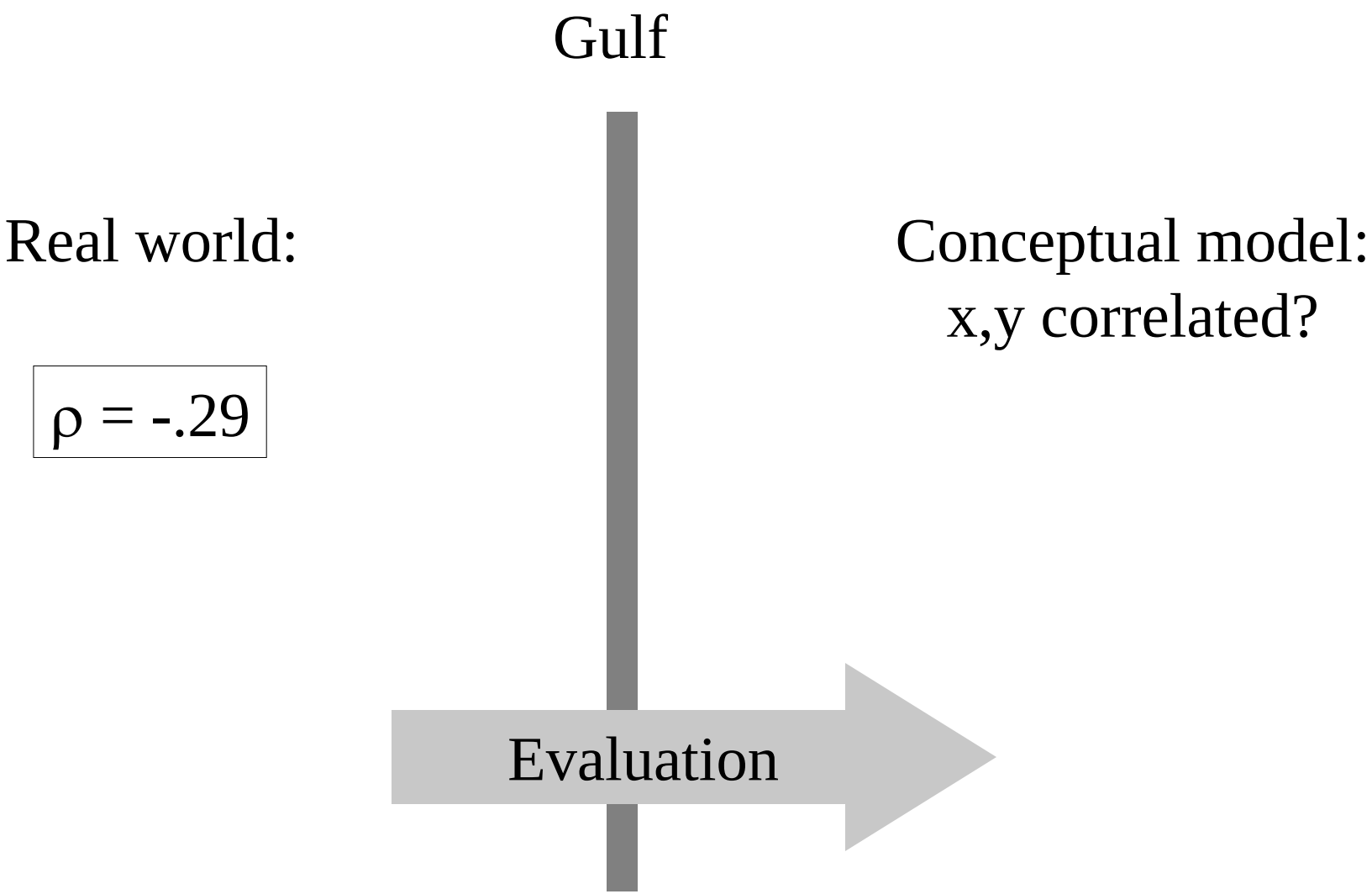
Real world:



Conceptual model:
x,y correlated?

Evaluation

Gulf of evaluation: statistical analysis (3)

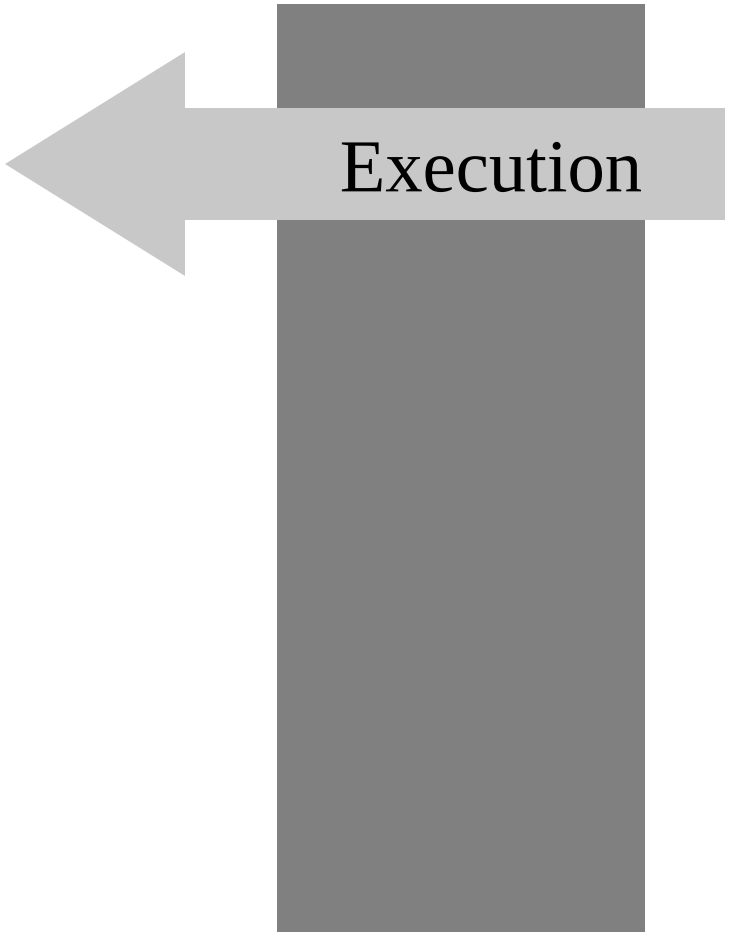


Gulf of execution: Drawing a rectangle (1)

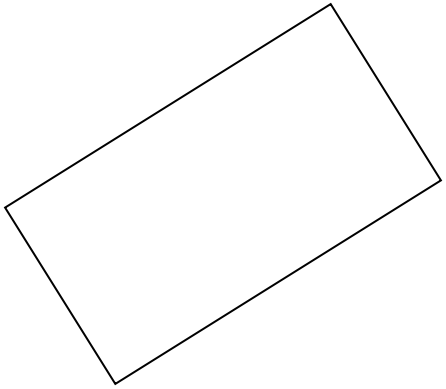
Real world

Gulf

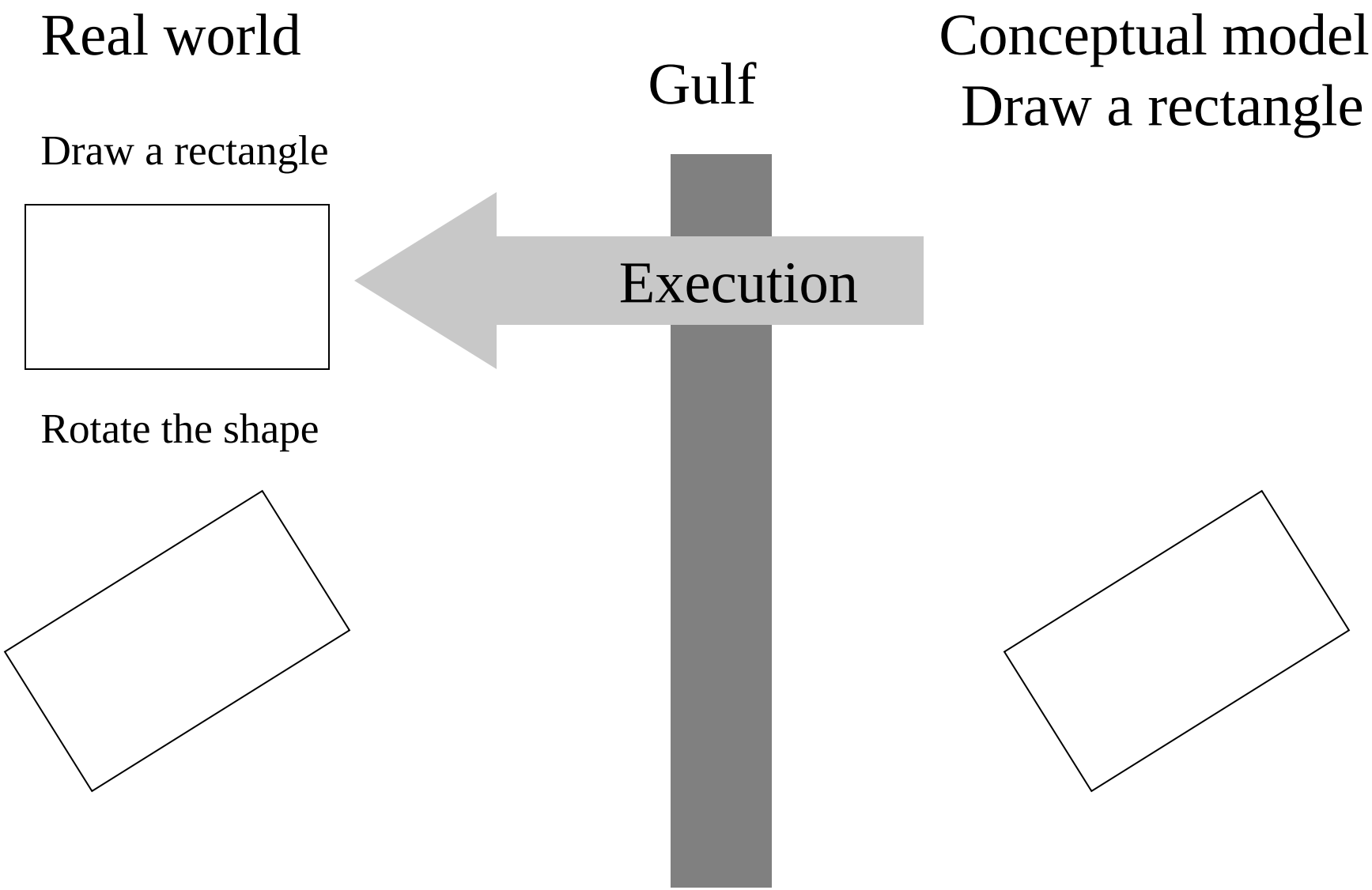
Conceptual model:
Draw a rectangle



Move 90 30
Rotate 35
Pen down
…



Gulf of execution: Drawing a rectangle (2)



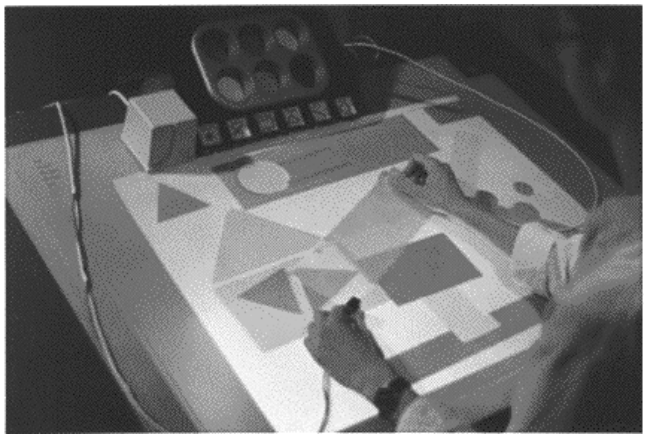
Gulf of execution: Drawing a rectangle (3)

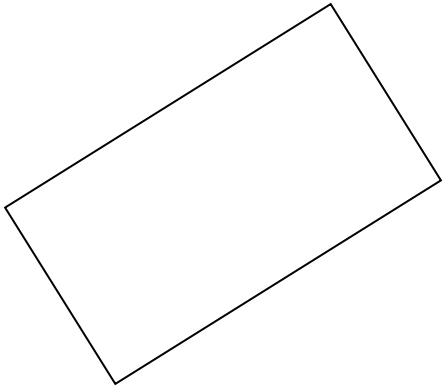
Real world

Gulf

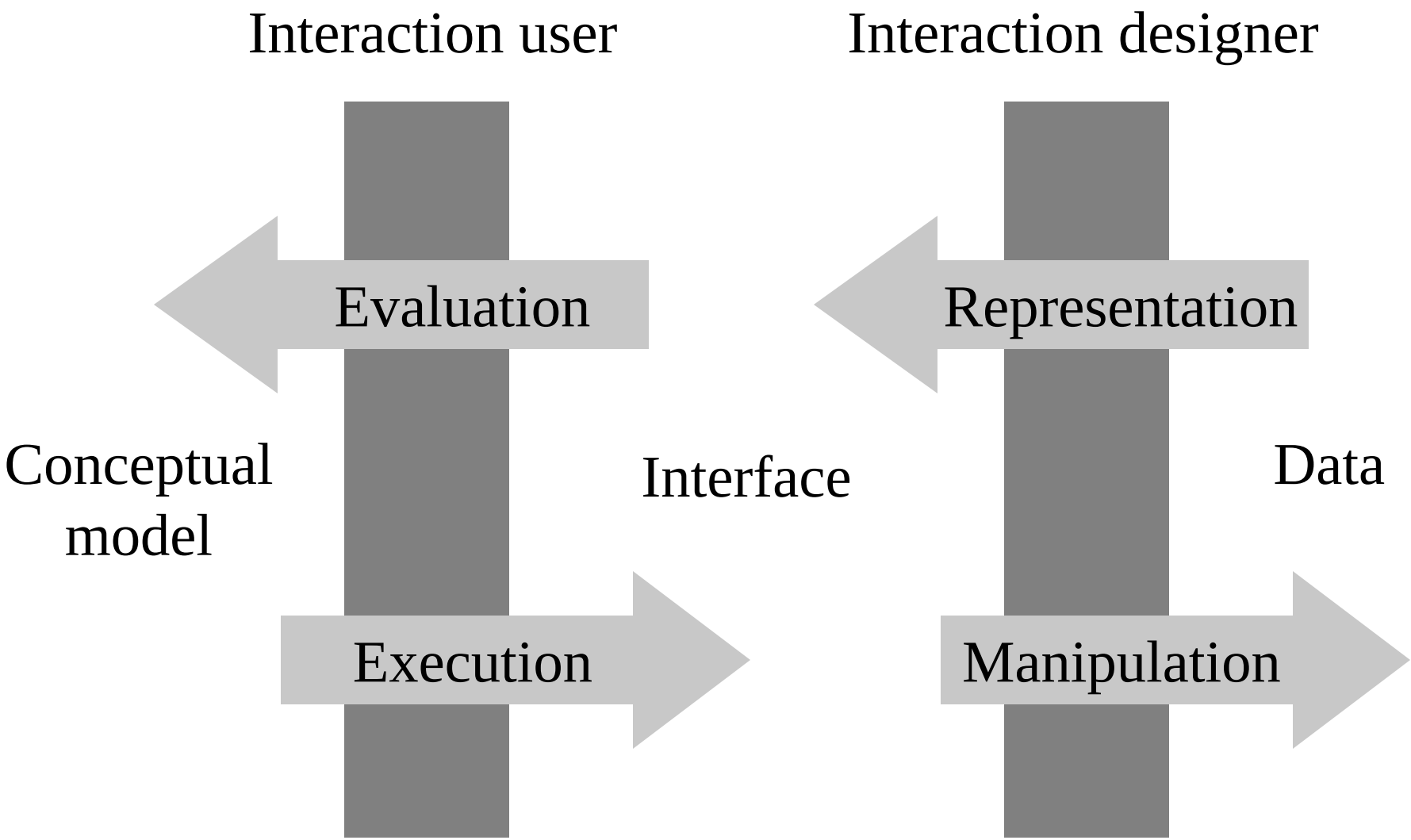
Conceptual model:
Draw a rectangle

Execution





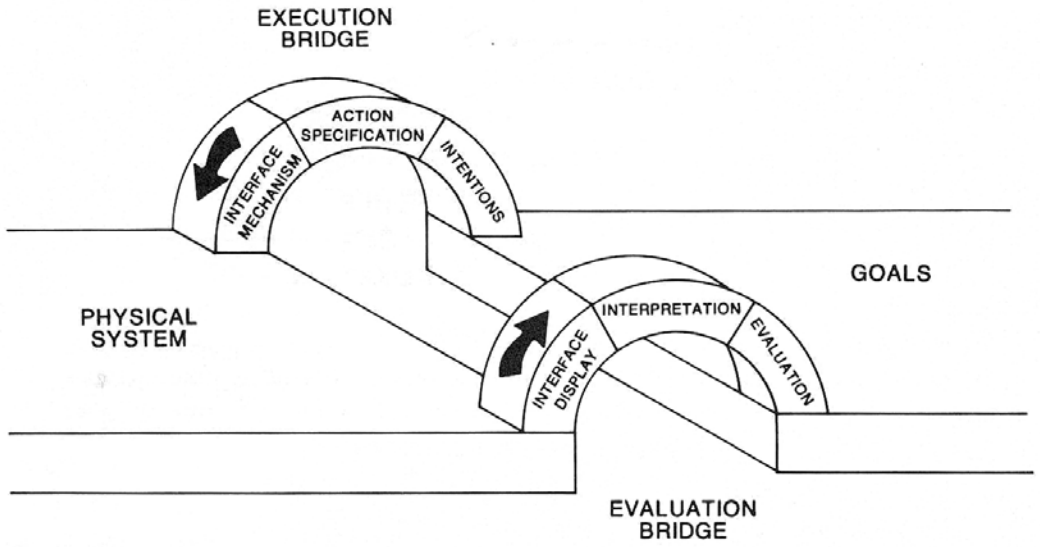
Interaction design: a double gulf?



Cognitive engineering example

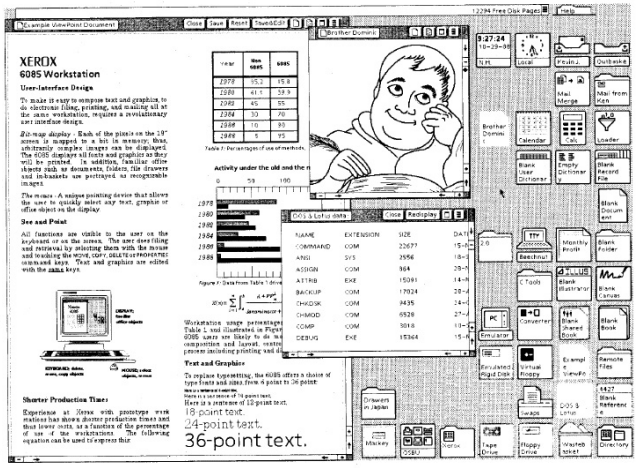
- Move “paper.tex” from ~/conferences/CHI_04
  to ~/conferences/UIST_04

  – Using a Unix shell (current directory is ~)
  – Using a GUI (starting from the desktop, no window open)



Direct manipulation

- Central ideas
  - Object understood by their visual characteristic
    - *Using good affordances*
    - *Using a good conceptual model and convincing metaphors*
  - Actions understood in term of their effects on the screen
    - *Rapid and incremental*
    - *Immediate visual feedback*
    - *Easily reversible*



- Outcome
  - Direct engagement
    - *the feeling of working* directly *on the task*
    - *No need to know the implementation details*
  - The display becomes reality: the WYSIWYG interface

Grammatical structure

- Object-action (Noun verb)
  - Modeless
  - Action always within the context of objects
  - Examples
    - *Drag and drop…*
    - *Select and delete*

- Action-Object (Verb noun)
  - Modal
    - *Mode can be dangerous*
  - Often more efficient
  - Examples
    - *Pick a tool, then use it…*

Interface metaphors

- Definition
  - Use of one kind of object or idea in place of another to suggest a likeness or analogy between them
- Purposed
  - Leverages our knowledge of familiar, concrete objects/experiences
  - Transfer this knowledge to abstract computer and task concepts
- Examples
  - Desktop, files, folders, trash can…
  - Paintbrush in a painting program

Metaphors caveats

- Too limited
  - The metaphor restricts interface possibility
- Too powerful
  - The metaphor makes believe that the system can do things it can’t
- Too literal or cute
  - Make it difficult to operate
- Mismatched
  - The metaphor makes it difficult to carry out the task

Direct manipulation: Good or Evil?

- Good for intermediate users
  - Recognition versus recall trade-off
- Explicit versus implicit command
  - “rename each file by adding ‘_old’ to its name”
- Limit of reification
  - How to align an object?
- Metaphor might be too restrictive
  - WYSIAYG: What You See Is All You Get
- Applications mix
  - Direct manipulation
    - *Tools, drag and drop interactions…*
  - Abstraction
    - *Menus, dialog boxes,…*

Readings for next class

- CH 10
- Evaluating the design without users (web)