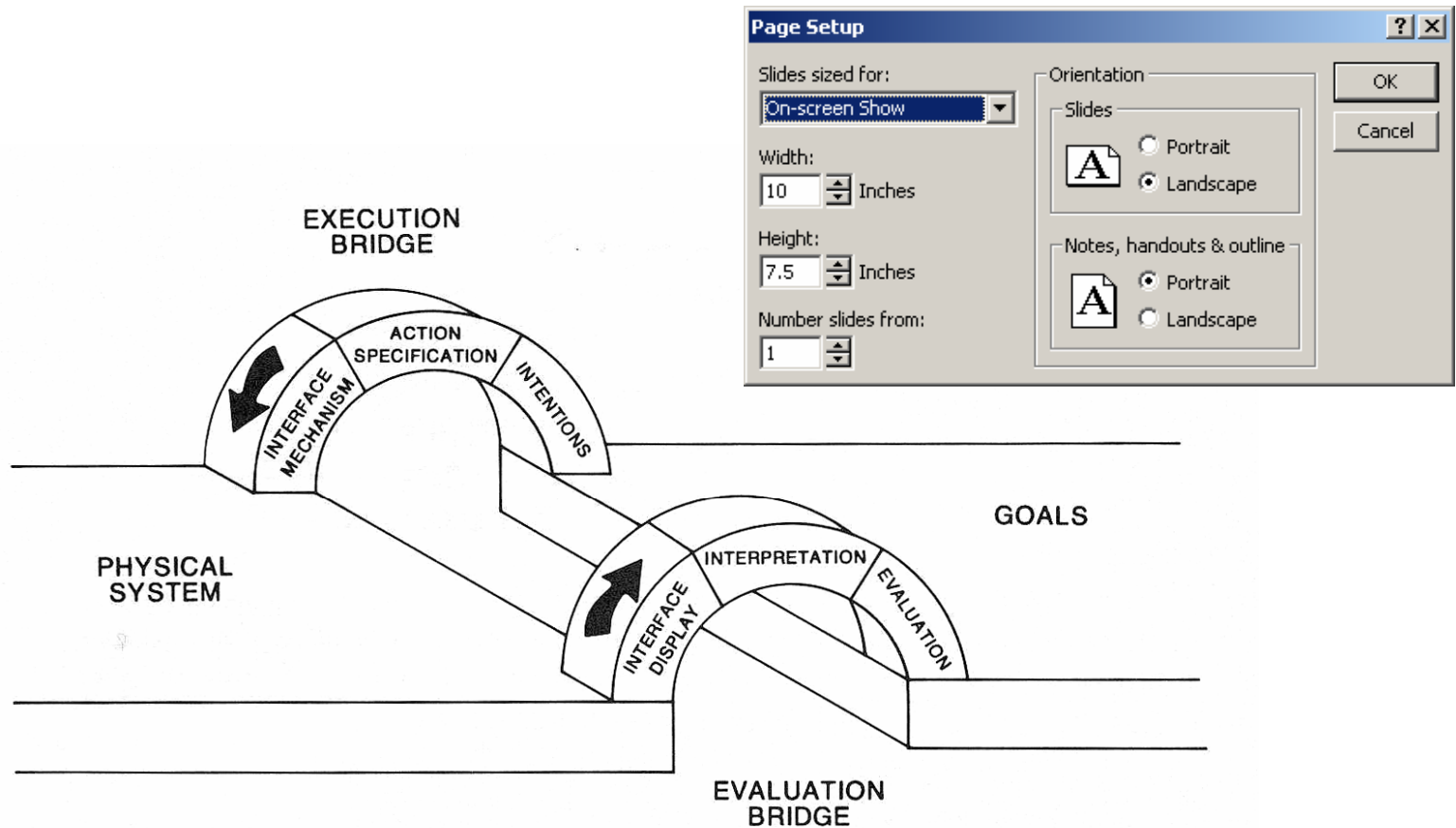


Questions?

- Project #2
- Homework #4 in
- Midterm this Wednesday (Closed books)

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?

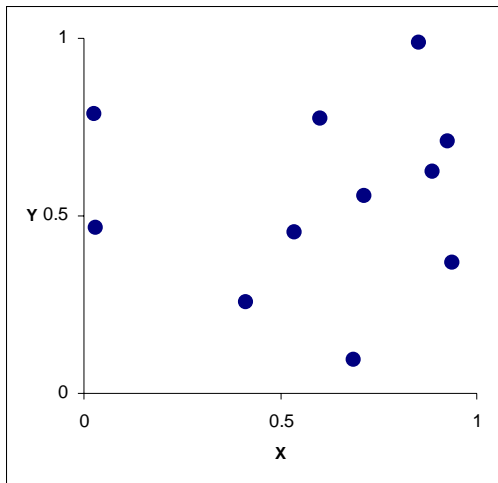
Evaluation



Gulf of evaluation: statistical analysis (2)

Gulf

Real world:

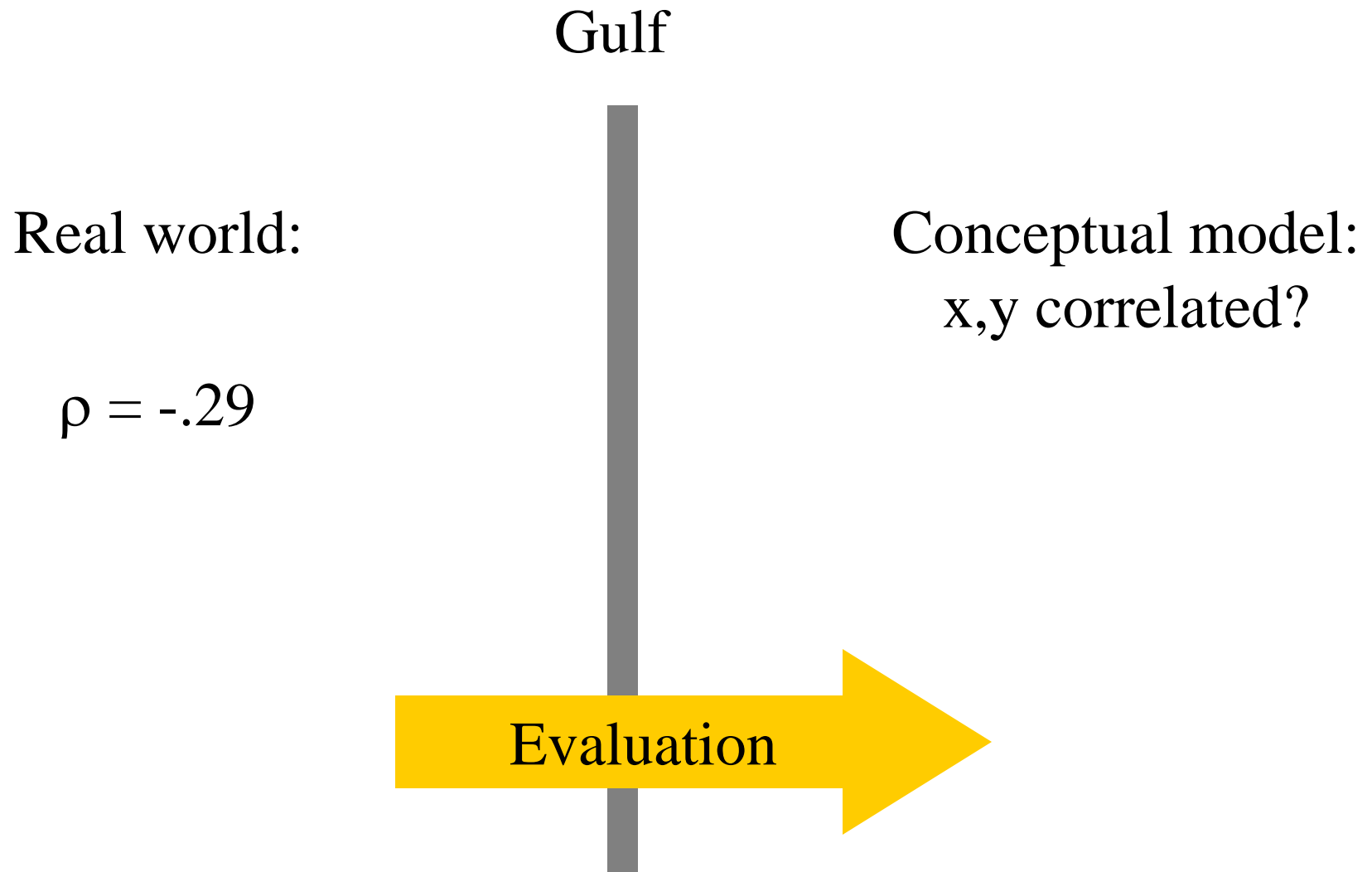


Conceptual model:
x,y correlated?

Evaluation



Gulf of evaluation: statistical analysis (3)

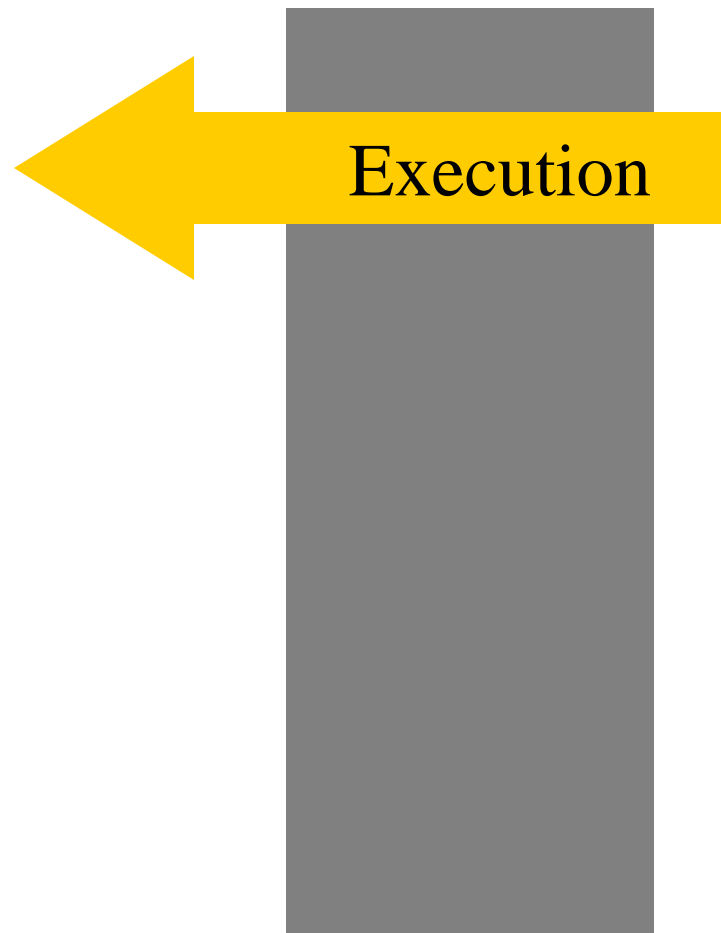


Gulf of execution: Drawing a rectangle (1)

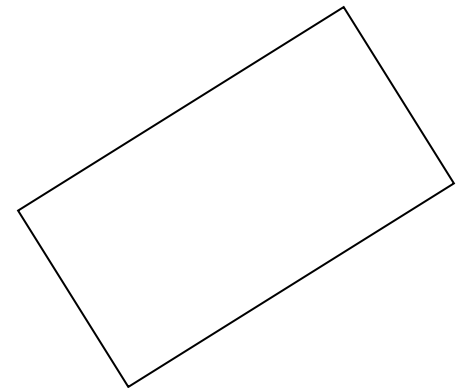
Real world

Gulf

Conceptual model:
Draw a rectangle



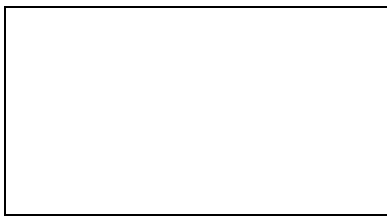
Move 90 30
Rotate 35
Pen down
...



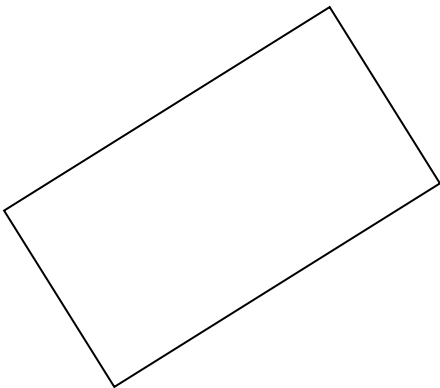
Gulf of execution: Drawing a rectangle (2)

Real world

Draw a rectangle



Rotate the shape

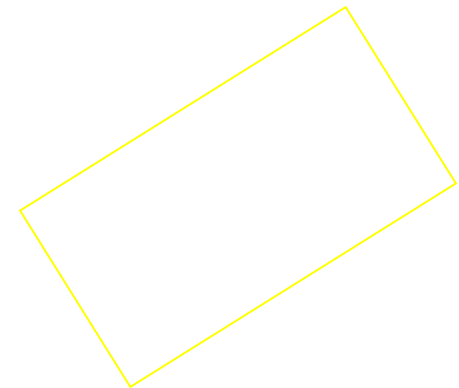


Gulf

Conceptual model:

Draw a rectangle

Execution

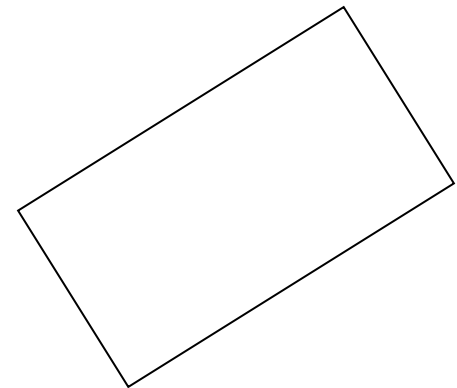
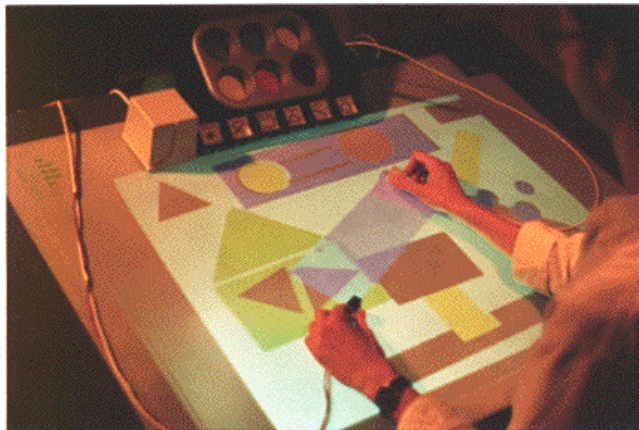
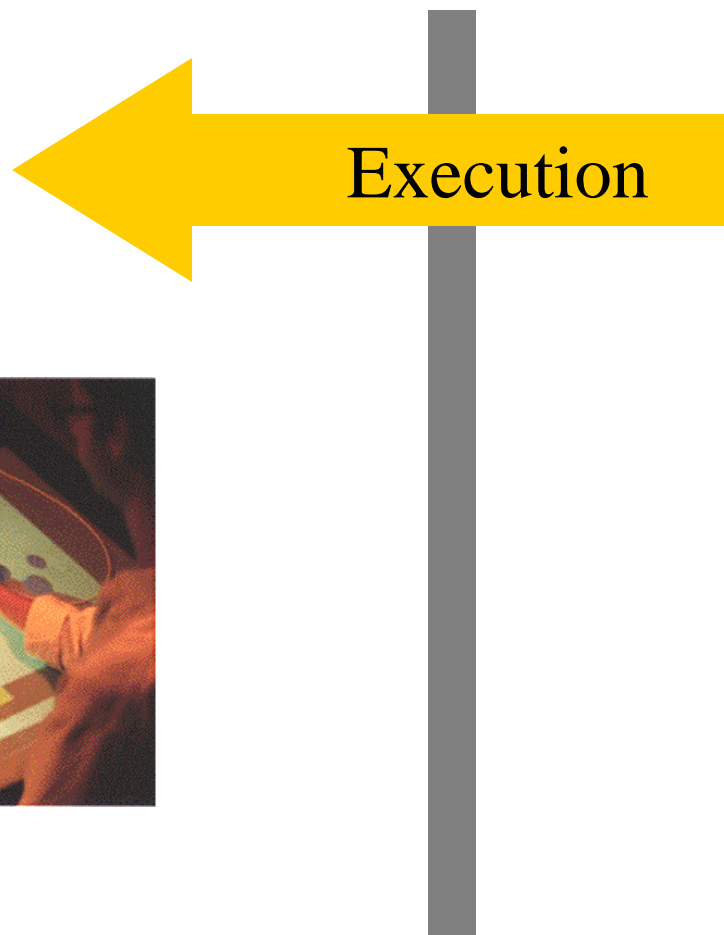


Gulf of execution: Drawing a rectangle (3)

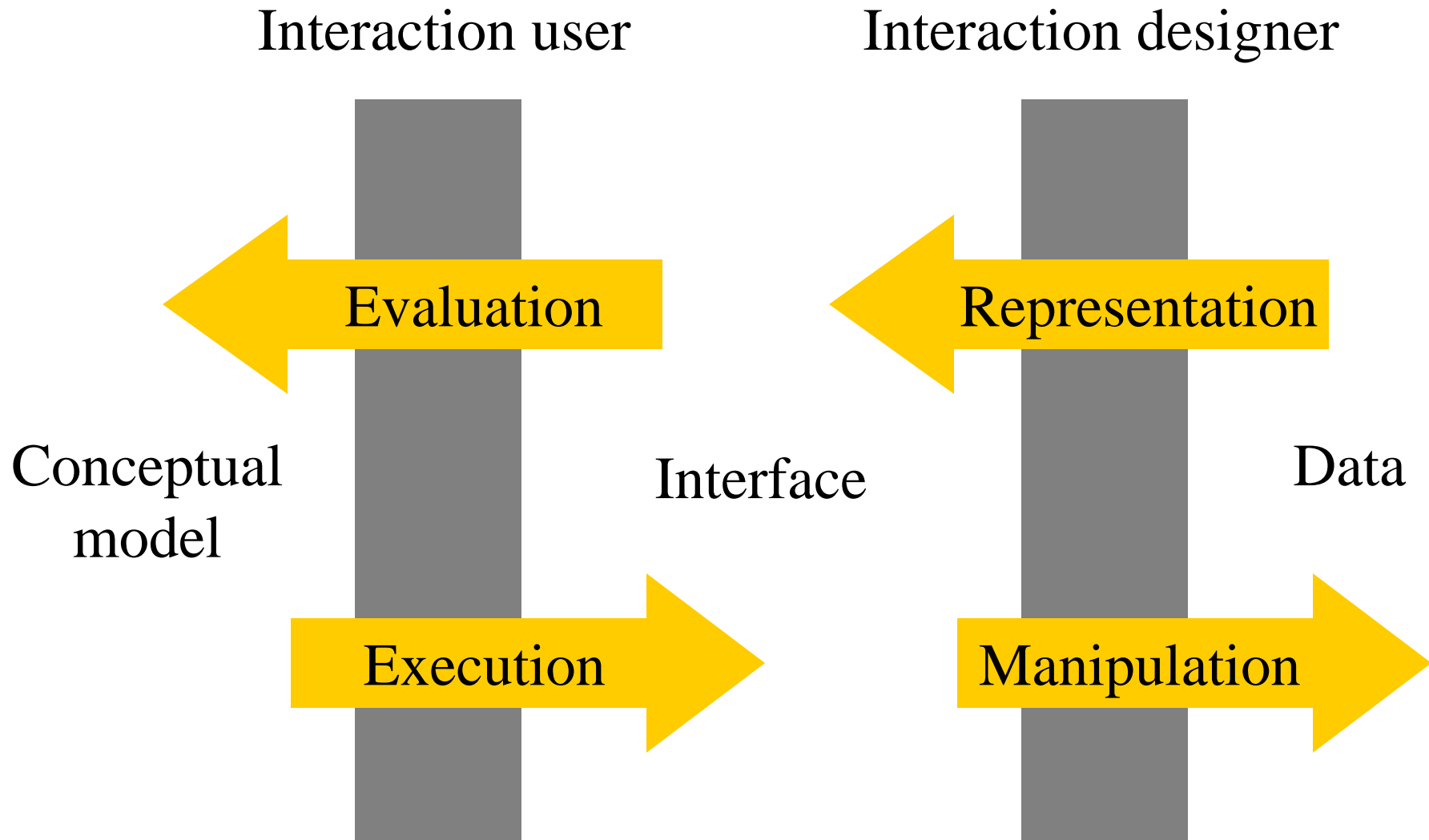
Real world

Conceptual model:
Draw a rectangle

Gulf

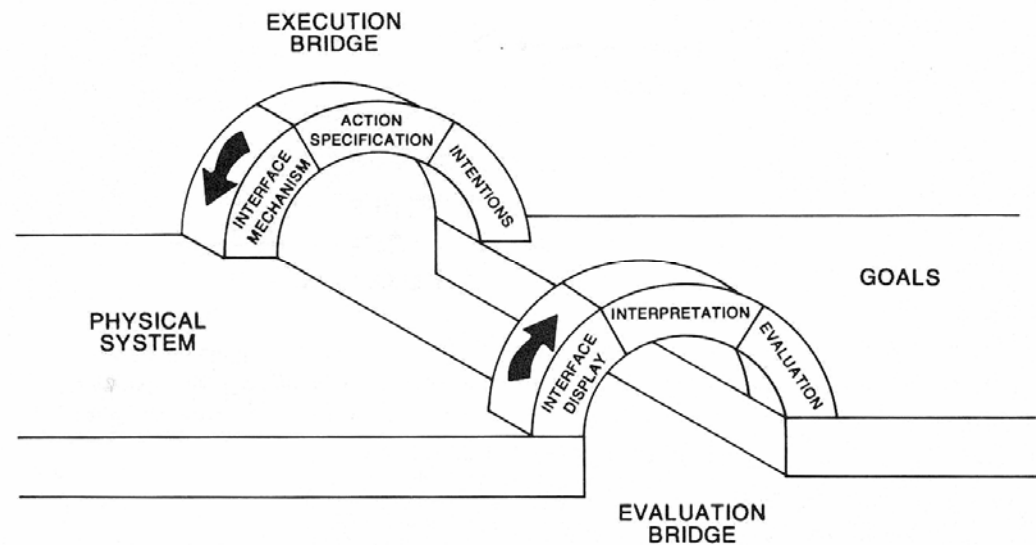


Interaction design: a double gulf?



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)
- What are the articulatory and semantic distances?



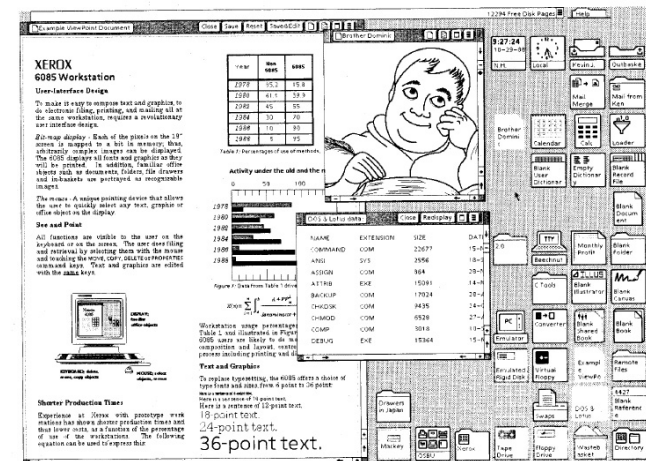
Direct manipulation

- 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
- Less error messages?



Interface metaphors

- **Definition**
 - Use of one kind of object or idea in place of another to suggest a likeness or analogy between them
- **Purpose**
 - 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
 - What about expert?
- 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,...*

