

Fundamentals of Human-Computer Interaction 1



Photos/collage by Jack L. Moffet in Dan R. Olsen, « Interacting in Chaos », Interactions, sept-oct 1999.

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About me

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About you

Why are you here?

What is your background?

What are your expectations?



Organization of the course

Fundamentals of HCI 1
vs.
Fundamentals of HCI 2

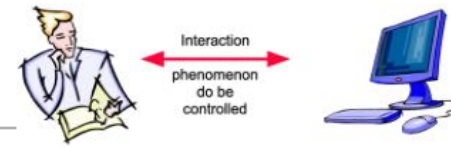
TA sessions

Web site for the course:

<https://www.lri.fr/~mbl/FundHCI>

Grading





Outline

FundHCI 1

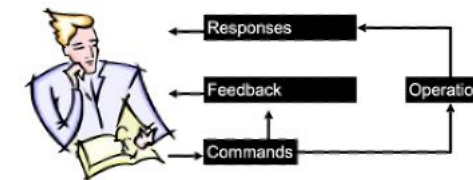
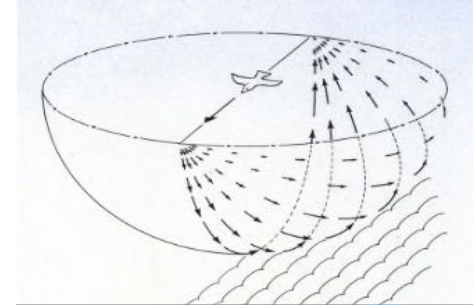
Introduction

Interaction styles

Psychology of interaction

Graphical interaction

Conceptual design



Outline

FundHCI 1

Introduction

Interaction styles

Psychology for HCI

Graphical interaction

Conceptual design

FundHCI 2

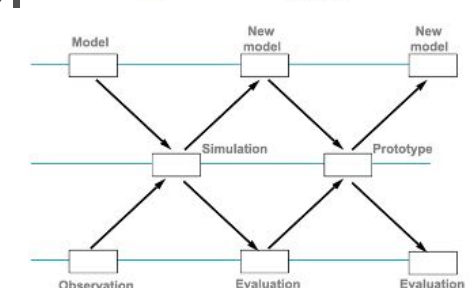
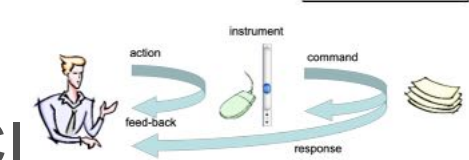
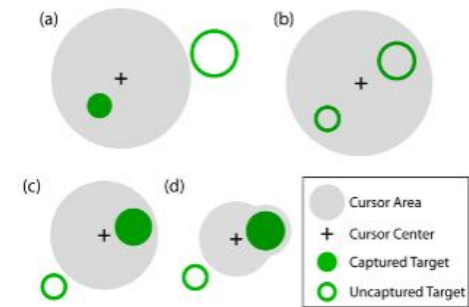
History

Advanced interaction styles

Pointing and navigation

Instrumental interaction

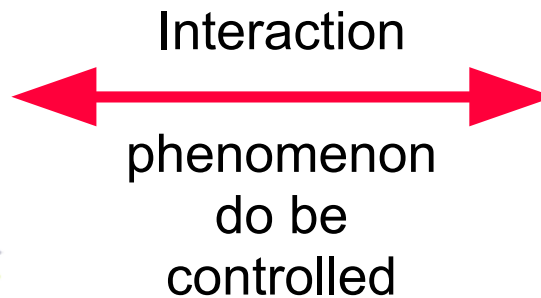
Theories and models for HCI



Human-Computer Interaction



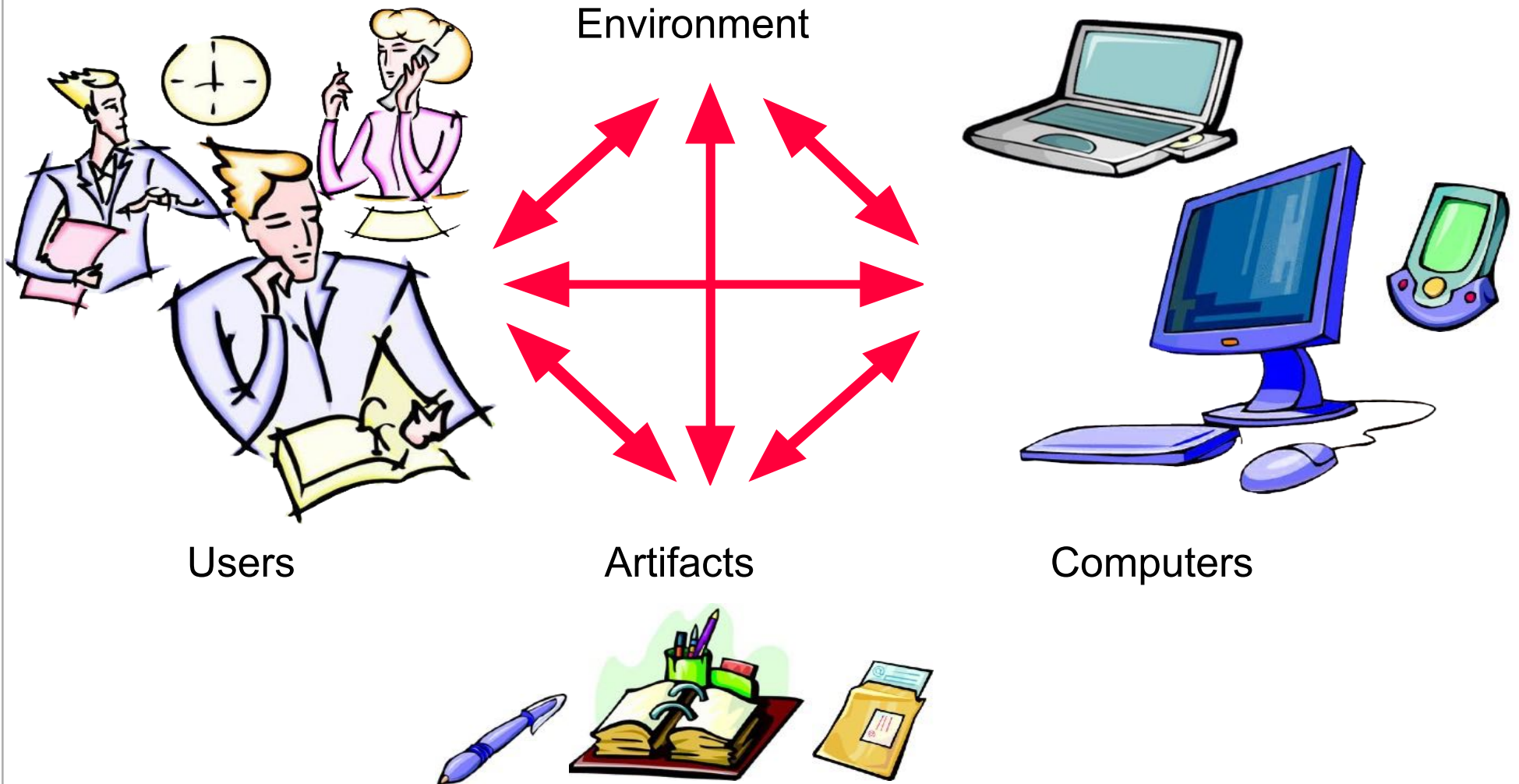
Capabilities: action,
perception, cognition



Capabilities: computation,
storage, input/output

Environment: physical, social,
organisational, cultural, etc.

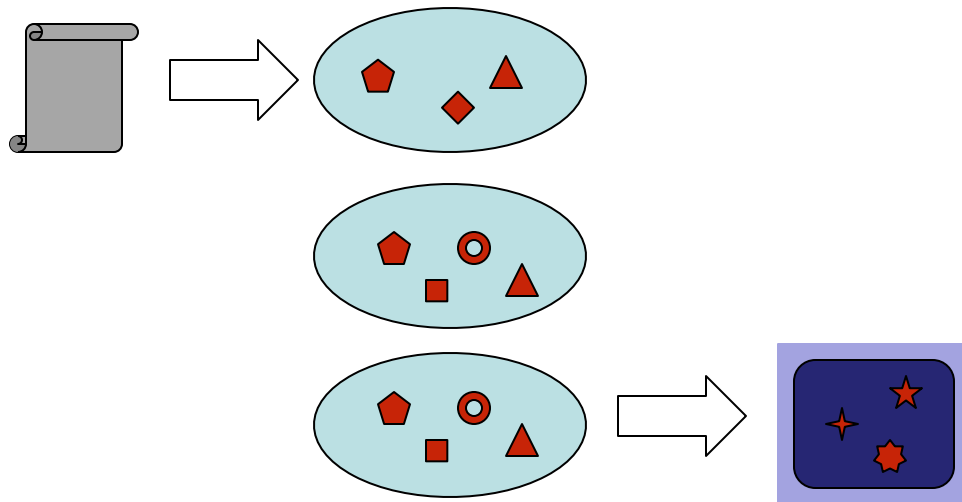
In the real world: *Situated Interaction*



An interactive system is **not** ...

An algorithmic system that:

- Reads input
- Processes it
- Writes results

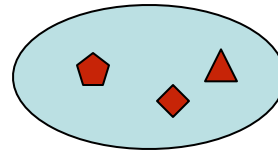


See Wegner, *Interaction is more powerful than algorithm*

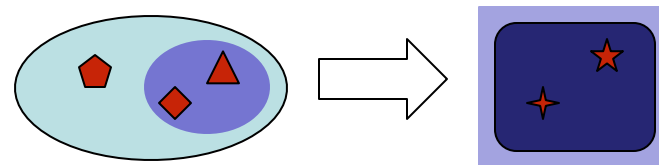
An interactive system is ...

A computer system that:

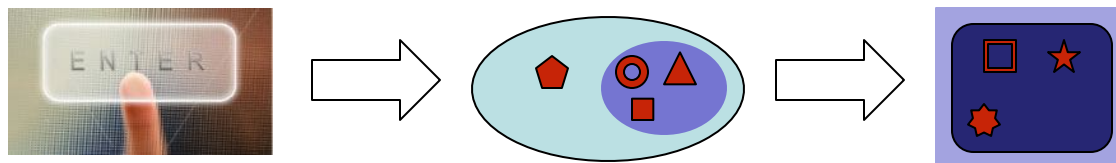
- Holds an internal state



- Creates perceivable representations of part of this state



- Reacts to input as soon as it arrives



Three properties of interactive systems

Reactive:

U provides input to S,

S must process it immediately and generate output to U

Open:

dependencies between S's output
and U's future input are unknown to S

Asymmetric:

U does not have to react immediately to S

U likes to know the dependencies between S's input and output

Two conceptions of human-computer systems

« **human-in-the-loop** »

System-centric view where the user must conform to the system's rules, e.g. provide input in a specific order or format

Addresses operational tasks where the user performs actions that the computer cannot (yet) do



Two conceptions of human-computer systems

« **computer-in-the-loop** »

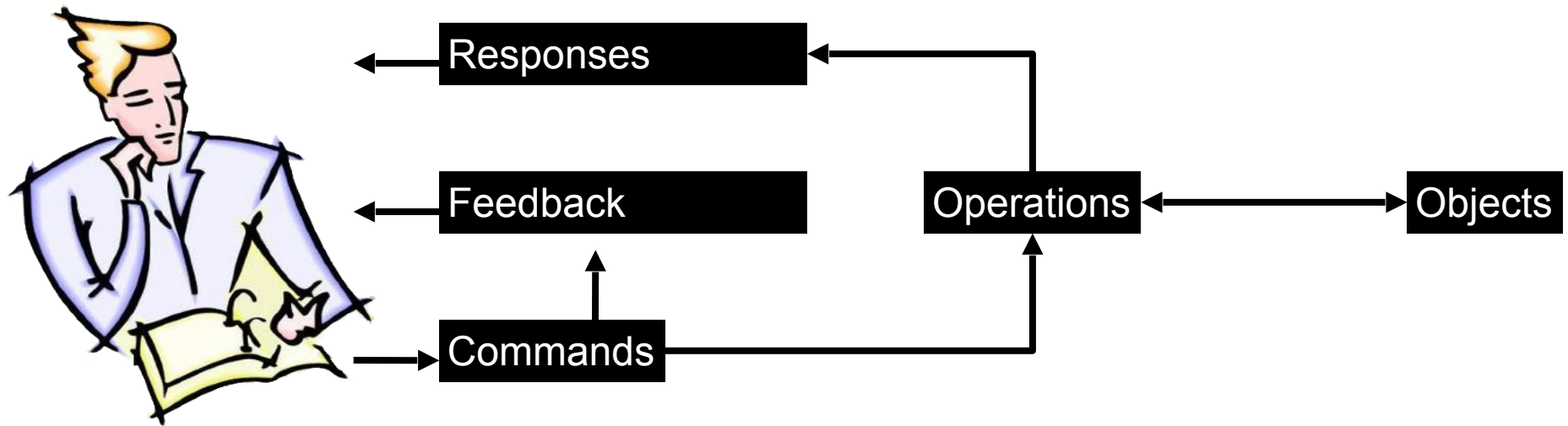
Human-centric view where the computer must be adapted to the capabilities of the user

Addresses creative tasks where the computer extends or augments the capabilities of the user



Conceptual model

Model of how this system operates



Ideally, matches the user's *mental model*

BEWARE!

We all use interactive systems

We all have ideas of how to improve them

... But few are designers or HCI researchers

Paradox of Human-Computer Interaction (HCI):

Measure of success = invisibility, transparency

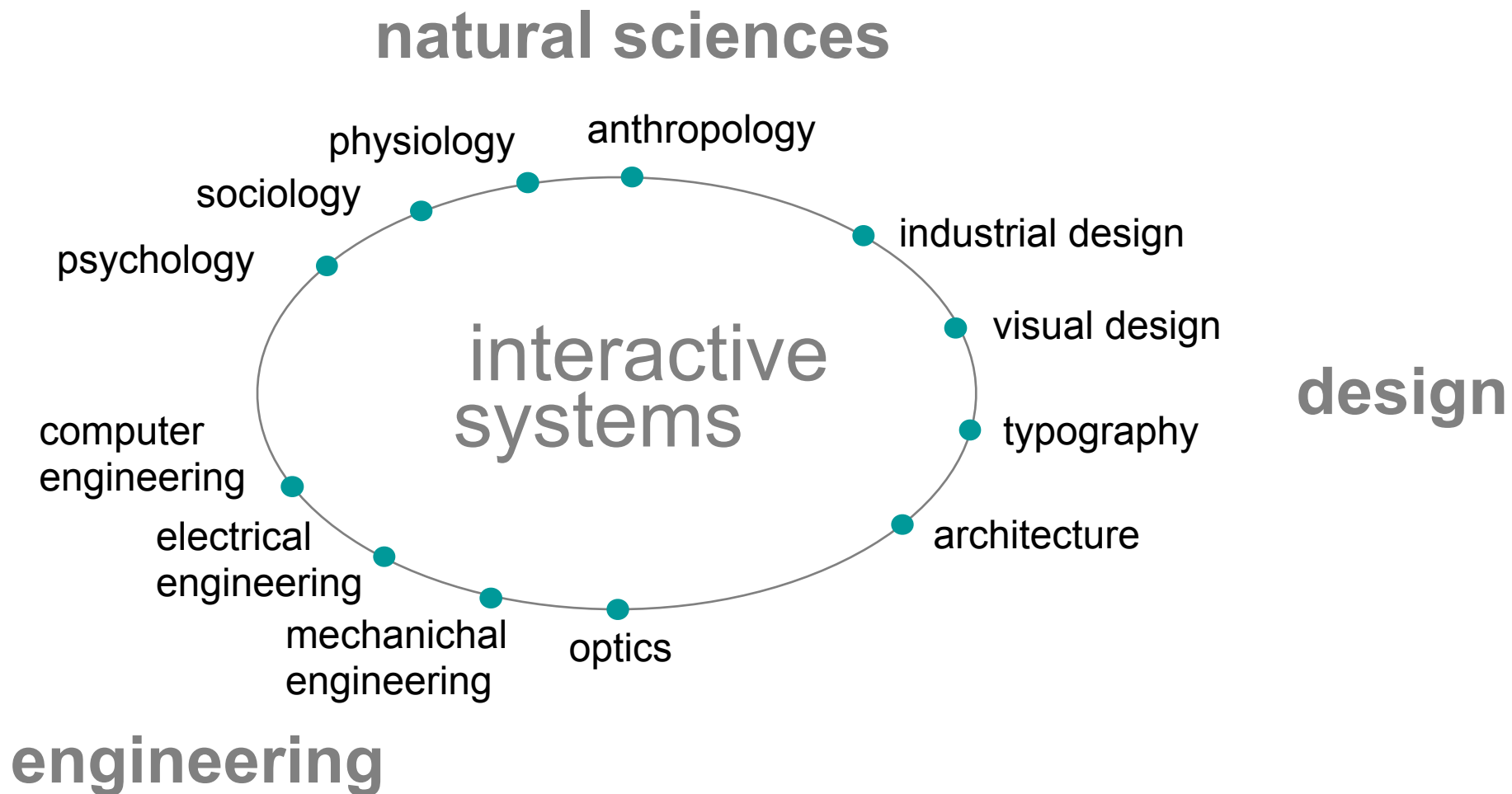
Making things simple is difficult (and difficult to understand)

Adaptability of humans is a strength ... and a weakness

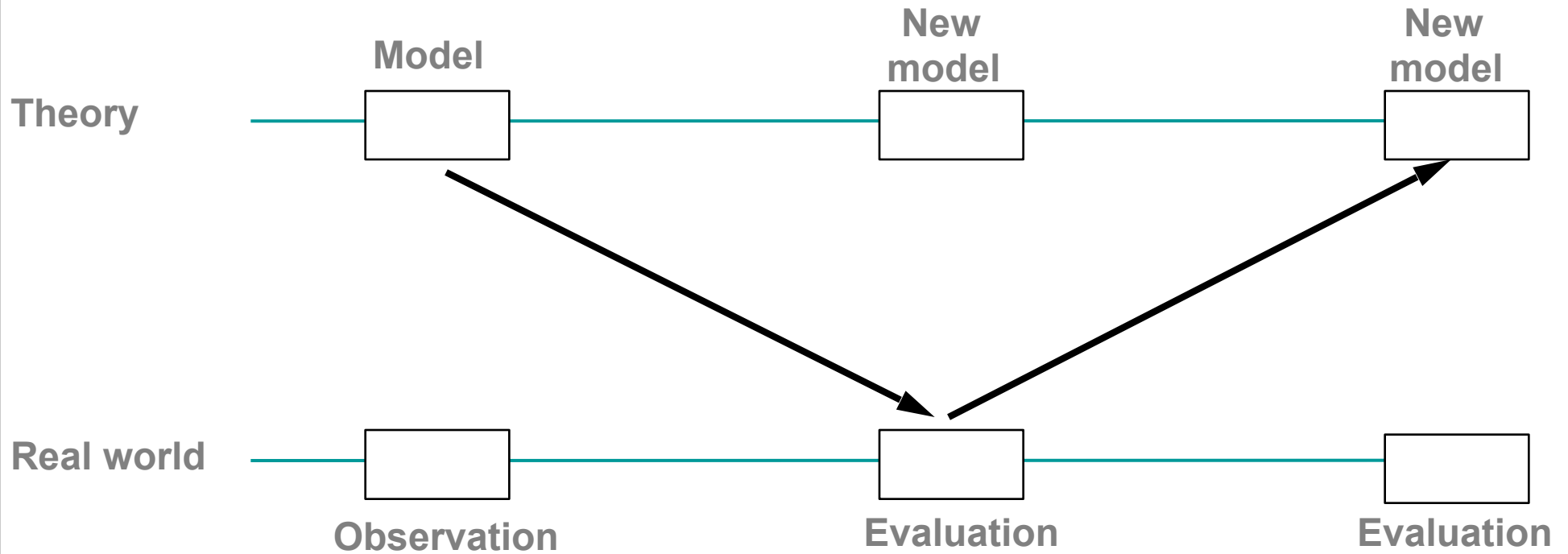
⇒ HCI is a complex multidisciplinary domain

⇒ Design and HCI research require unique skills

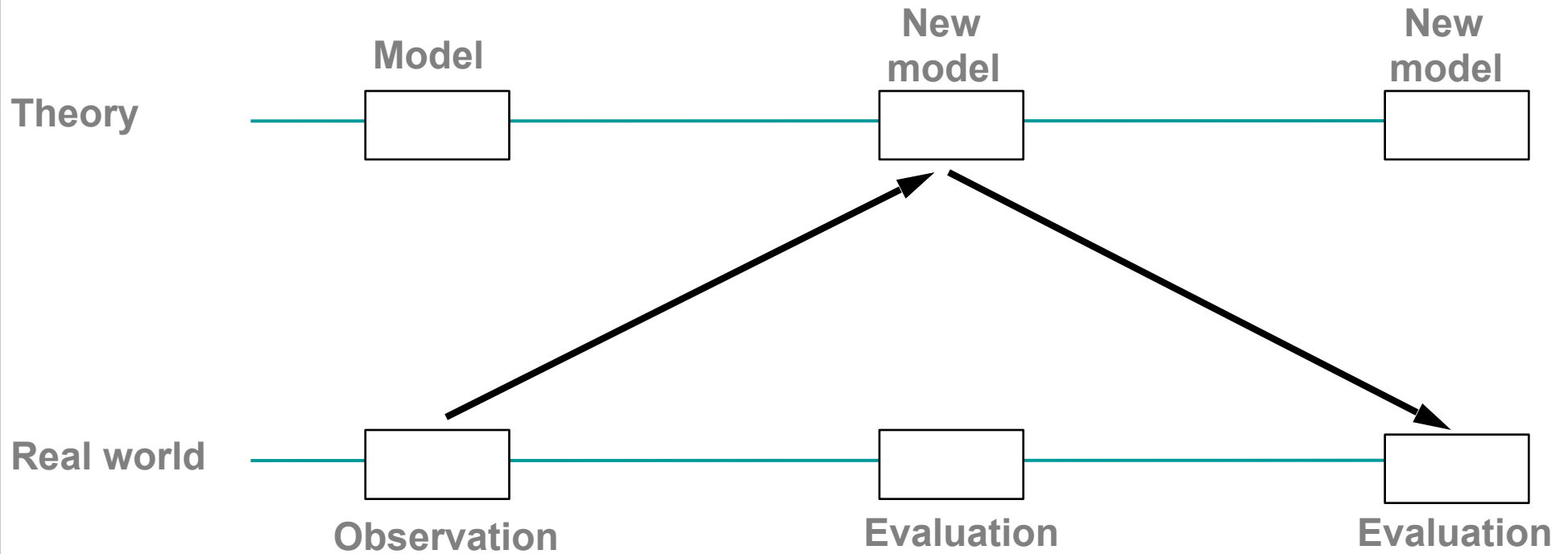
Multidisciplinary approach



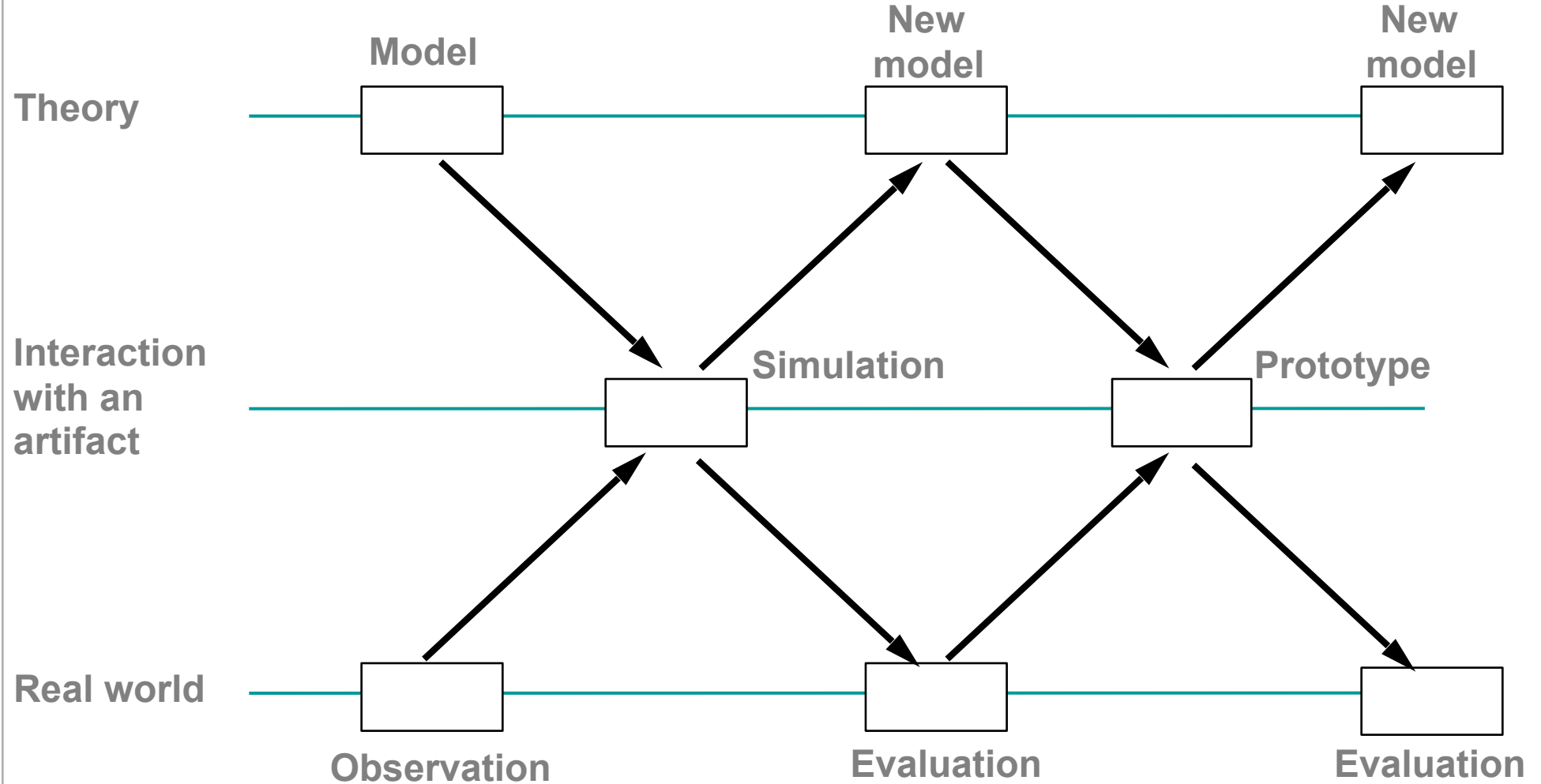
Research strategies: Psychology



Research strategies: Anthropology



Research strategies: HCI



The design of interactive systems

Importance of human factors

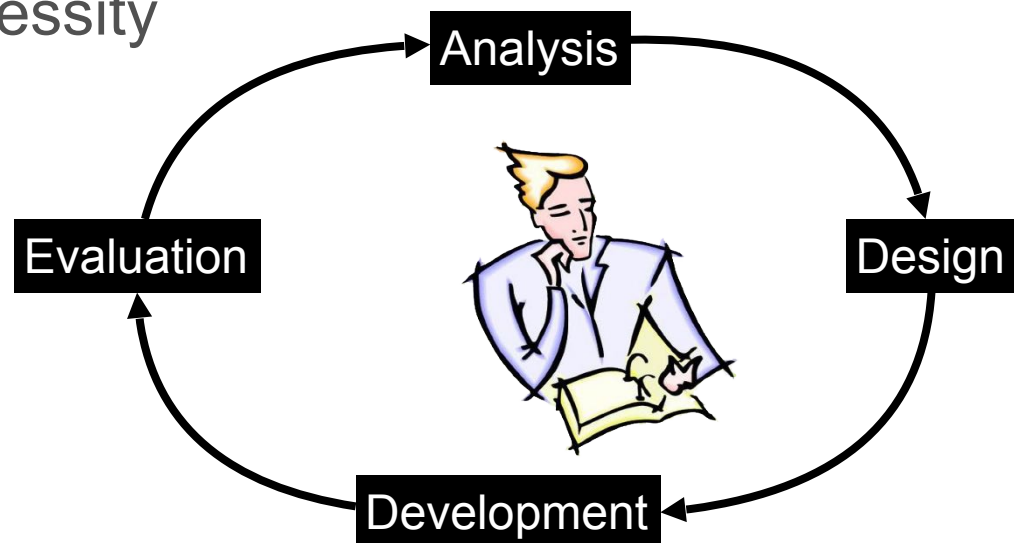
Few quantitative and/or generative theories

Chaotic aspect of design

Small causes, large effects

Iterative approach is a necessity

User-centered design



Interaction paradigms

Computer-as-tool

First person interfaces
Augment the user



Focus of
the course

Computer-as-partner

Second person interfaces
Delegate tasks



Computer-as-media

Third person interfaces
Human-human communication

