

Human-Computer Interaction

Week 3: Second Wave HCI (Part 1)

Chunk 3: Phenomenology

COMS30029

aka #HCI_Theory

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Credits: Some slides from Matthew Purver

Week 2: Second Wave HCI (Part 1)
From Cognition to Experiences of Bodies

Chunk 3: Phenomenology

What is Phenomenology?

Examples: Space and Time

Analysis of experience through *breakdown*

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What is Phenomenology

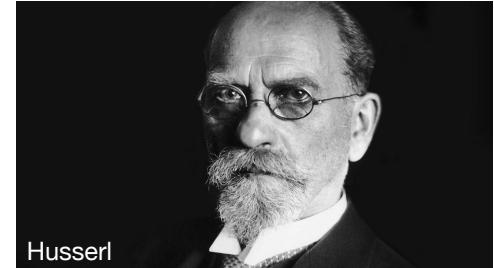
A philosophical tradition: concerned with **the study of experience and consciousness**

Began with the work of Edmund Husserl (1859-1938)

Then developed by many other philosophers, including:
Martin Heidegger (1889-1976) and Maurice Merleau-Ponty (1908-1961)

Direct **relevance to design**:

- Phenomenology studies experience
- Experience is affected by tools, artefacts, representations, technology



Husserl



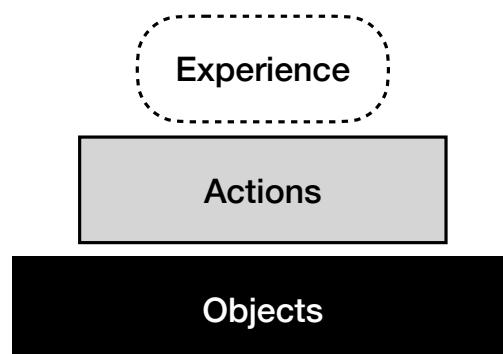
Heidegger



Merleau-Ponty

Phenomenology: Perspective

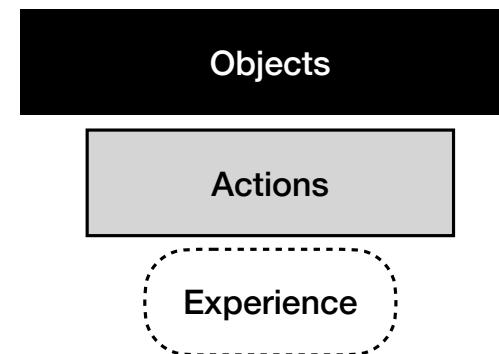
What is there? What is it made up of? How do we know?



Rationalist tradition

Assumptions:

- Objective physical world is basic
- Subjective mental world is fundamentally different



Phenomenological tradition

Assumptions:

- Objective-subjective divide is an illusion
- Experience of "being-in-the-world" is primary

Phenomenology: Perspective

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Phenomenological tradition

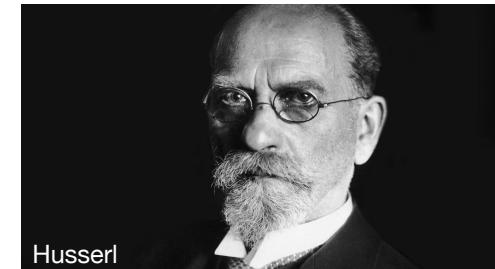
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Phenomenology: Three aspects

1. Consciousness is about something:

- Consciousness reflects intent
- When we perceive something, we intend to perceive it



Husserl

2. Consciousness itself is phenomenal

- There is a “feel” or a “what it is like” aspect to conscious experience
- Once we intend to perceive something, there is an affective feel that comes with it
- E.g. seeing red, or tasting a lime, being in a particular place (e.g. a feeling of discomfort or comfort)



Heidegger

3. Consciousness has temporal structure

- Our perception and experience of things differ over time
- Includes the present moment, and anticipation of what will happen next (protection), and a retention of what happened just before



Merleau-Ponty

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Phenomenology of Space

Space in rationalistic tradition:

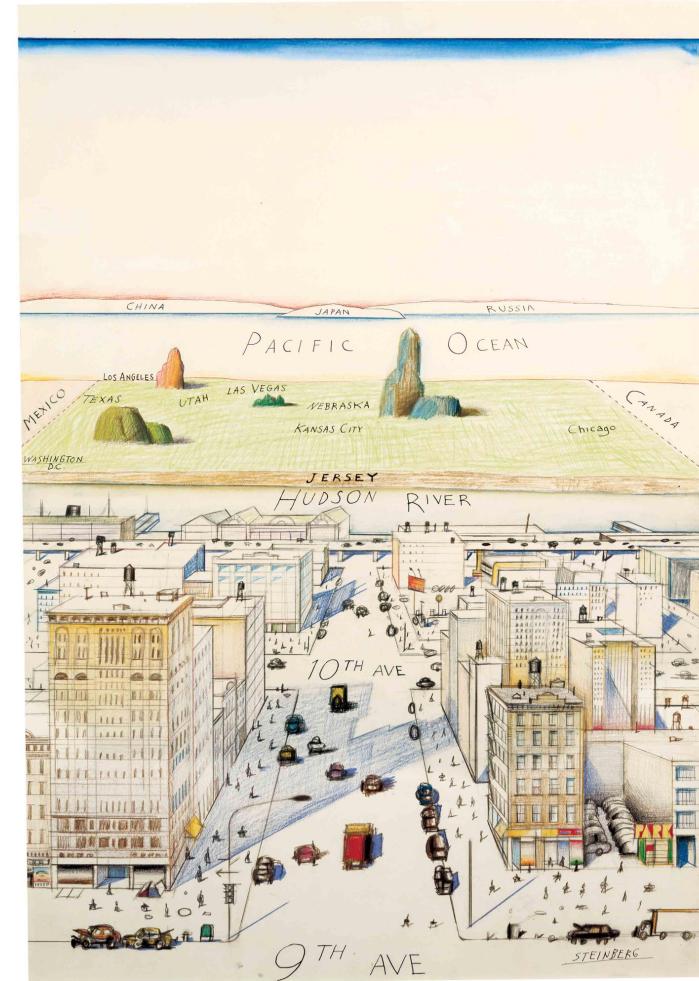
- Cartesian coordinate system
- Two or three axis (x, y, z)
- Interval scales (mm, cm, m)

Spatial
Systematic

Is this how we experience space?

Helps to define what objects are:

- objects are extended in space
- Two different objects can't be in the same place at the same time
- The same objects cannot be in two different places at the same time
- Distance from A to B = distance from B to A



Saul Steinberg, View of the World from 9th Avenue, 1976

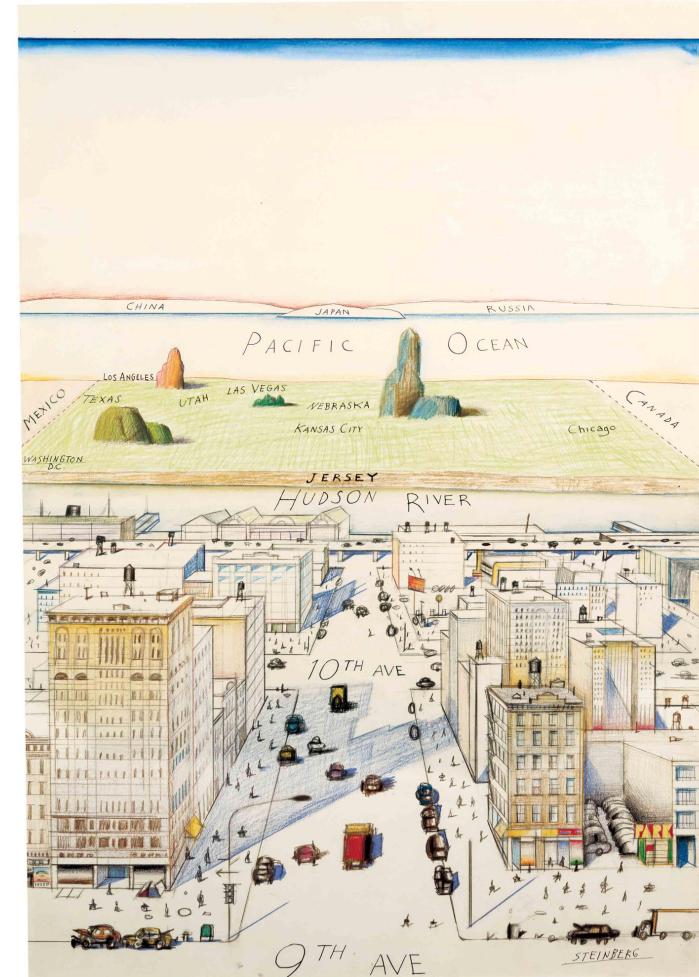
Phenomenology of Space

Space in phenomenological tradition:

- Space is experience to reflect our interests, concerns and activities
 - Not as a coordinate system!

Our experience of space is not systematic:

- Does it feel as far travelling from home to university or from university to home?
- Do journeys take longer when we are late?
- The distance from A to B doesn't feel like the distance from B to A



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Phenomenology of Time

Time in rationalistic tradition

- Interval scale (ms, sec, hour, etc.)
- Ordered, equal duration

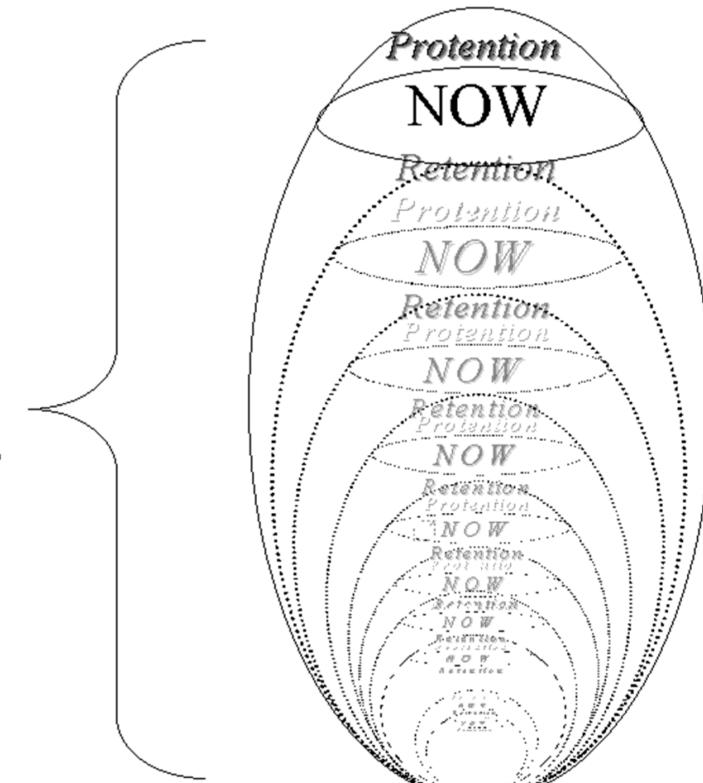
Every HCI theory lecture is ~1hr long

- Does it feel like that?
- Do you zero out?
- What order did events happen in

How do you listen to/experience a melody?

How does time in an exam feel like?
Ordered? Equal in duration?

Present
Perceptual
Consciousness



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Analysis of experience through *breakdown*

Practical Phenomenology

A: What would a phenomenological analysis of experience be like?

Q: A method that challenges our prior assumptions and prejudices:

- **Breakdown:** objects and properties show up to us when something goes wrong

Practical Phenomenology



Are you aware of the nail?
Are you aware of the hammer?
Are you aware of the tendons
in your arm?



Are you aware of the steering wheel? Gear?
When you are driving?
When you are learning to drive?
When something goes wrong?



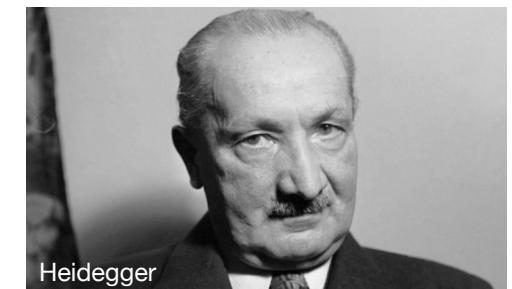
Do you notice the keys? When?
Do you notice the letters, when?
Do you notice the words? When?
Do you notice the word processing
application? When?

Breakdown

For Heidegger: “Objects” and “Properties” only emerge through *breakdowns* in activity

Breakdowns are encountered and interpreted in terms of **particular activity** in context

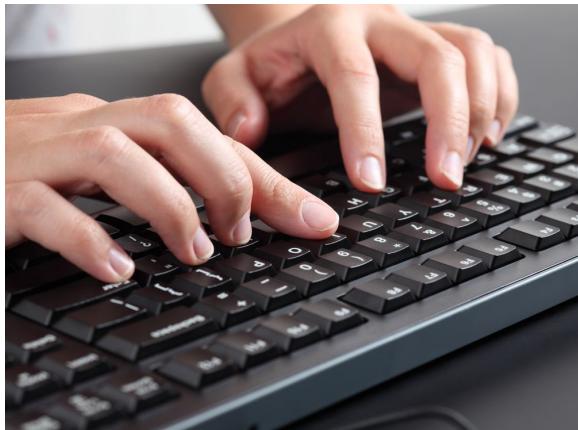
-> *Breakdowns can help us analyse objects, their properties and their place in a given activity*



Heidegger



Practical Phenomenology



Typing an essay

- When do you notice the keys?
 - Catch your finger between keys
 - Use an unfamiliar machine
- When do you not letters?
 - Typos
 - Non-standard characters
- When do you notice words?
 - An ambiguity (that wasn't in your head)
 - Someone doesn't understand
- When do you notice the application?
 - A command is absent
 - Application crashes

Breakdown: modes of tool use

Ready-to-hand

The tool is *transparent* to us, we are engaged in the task

- We don't think of the keyboard
- We are unaware of the keys
- We are *engaged* in the essay

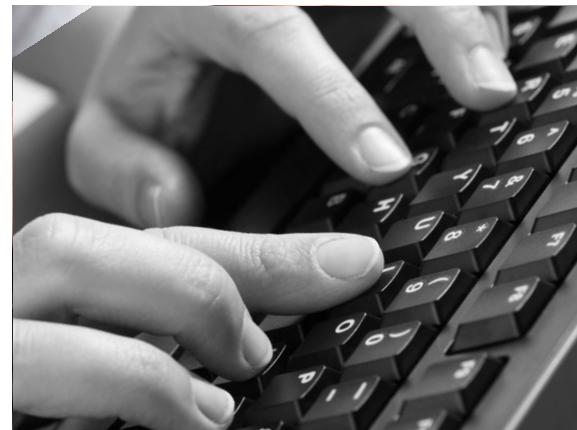


Breakdown: modes of tool use

Present-at-hand

The tool becomes *obtrusive* because we encounter an obstacle to our task

- a key gets stuck and doesn't produce a letter we expect on the screen, or
- the word processing application crashes



Breakdown: modes of tool use

Unready-to-hand

The tool itself becomes an object of reflection and the primary activity changes

- We stop writing the essay
- Try to fix the stuck key or the application crash



Evidence of Breakdowns in HCI

Alzayat et al. (2017) Measured awareness of the tool during breakdown and non-breakdown situations

- Users could identify changes in the presentation of the tool in different modes

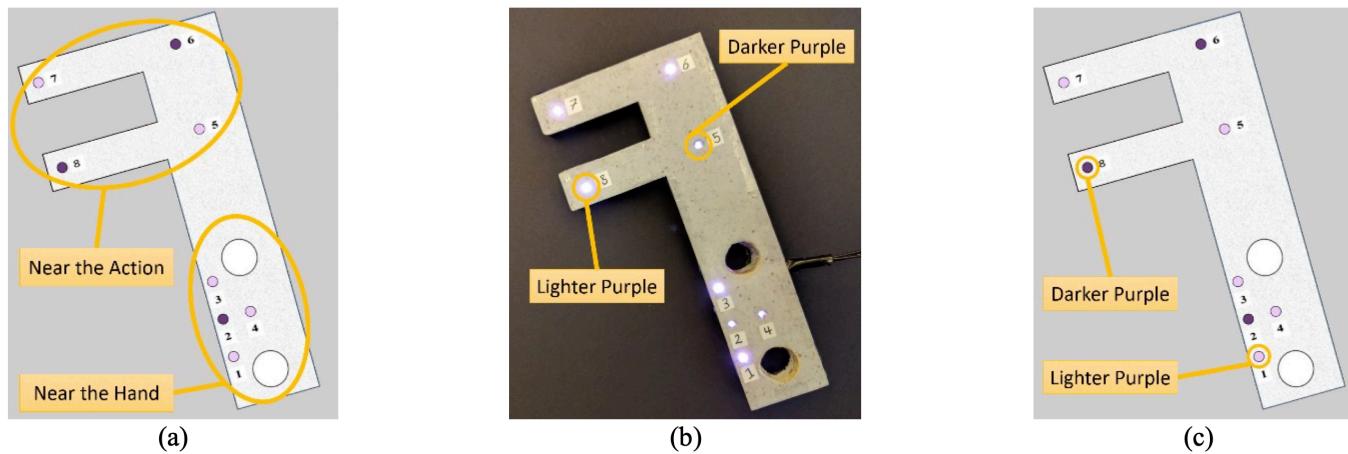


Figure 2. (a) The secondary task stimuli: near the hand and near the action, on (b) the physical tool, and (c) the virtual tool.

Alzayat, Ayman, Mark Hancock, and Miguel A. Nacenta. "Measuring Readiness-to-Hand through Differences in Attention to the Task vs. Attention to the Tool." In *Proceedings of the 2017 ACM International Conference on Interactive Surfaces and Spaces*, pp. 42-51. 2017.

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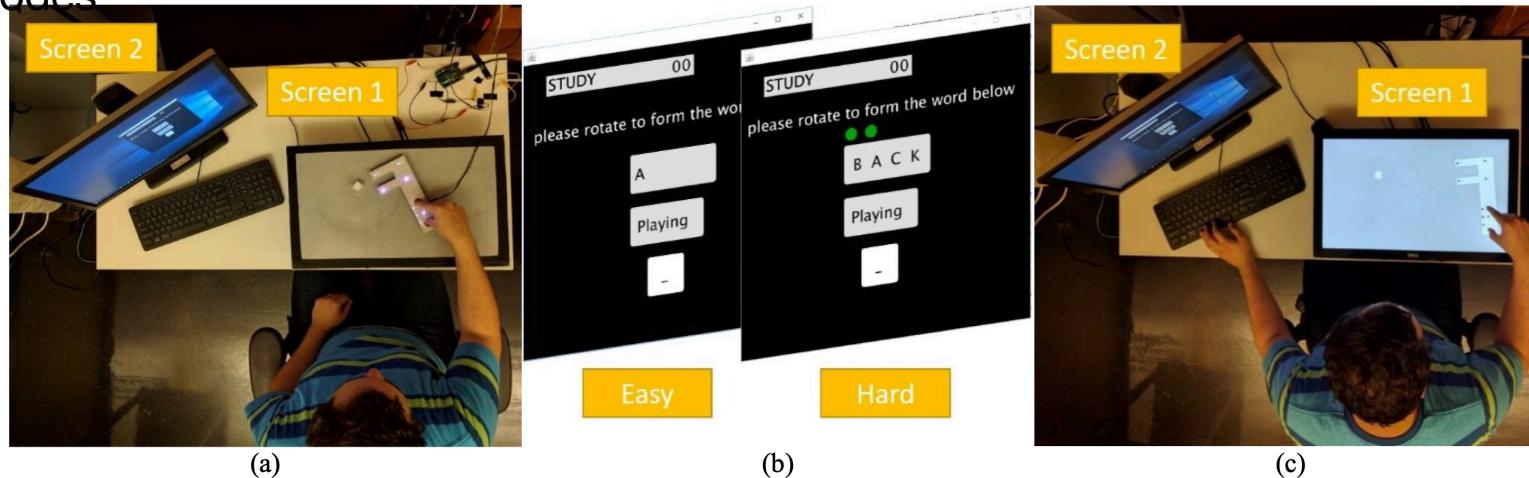


Figure 4. (a) The physical study setup with a participant holding the physical tool. (b) The second screen for the primary task. (c) The virtual study set up with the participants holding a virtual tool.

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Using Breakdown in Game Design

Ryan and Seiger 2009 studied players behaviour in games

- Identified 17 patterns of breakdown
- Organised in terms of types and severity

Two kinds of breakdown

- Breakdown of interaction
- Breakdown of illusion



Figure 1. Playing all 5 keys in Guitar Hero using 4 fingers.
© Copyright 2005 RedOctane.

Ryan, William, and Martin A. Siegel. "Evaluating Interactive Entertainment using Breakdown: Understanding Embodied Learning in Video Games." In *DIGRA Conference*, vol. 9. 2009.

Using Breakdown in Game Design

Breakdown of interaction

Push players to develop new gameplay strategy:

- E.g. From avoiding obstacles to using obstacles as shortcuts
- Breakdown as an accidental discovery of an hidden affordance

Support learners, promote better play



Figure 4. Developing strategy example of breakdown in *SSX On Tour* © Copyright 2005 EA Sports. The game here is different but illustrates the same point.

Ryan, William, and Martin A. Siegel. "Evaluating Interactive Entertainment using Breakdown: Understanding Embodied Learning in Video Games." In *DIGRA Conference*, vol. 9. 2009.

Using Breakdown in Game Design

Breakdown of illusion

Player are disconnected from the unfamiliar functioning of the virtual worlds (i.e. due to false affordances)

- Stuck in a virtual room with objects to interact with
- No interaction contributed to goal of interaction: to move out of the room
- Player randomly clicked on the screen

They are thrust out of the state of engagement and immersion



Ryan, William, and Martin A. Siegel. "Evaluating Interactive Entertainment using Breakdown: Understanding Embodied Learning in Video Games." In *DIGRA Conference*, vol. 9. 2009.

In summary...

Phenomenology focuses on the **analysis of experience** (or *being-in-the-world*) from a first-person point of view

- We are always *thrown*: engaged, immersed, concerned

Practical action is *prior* to theoretical understanding

No object-subject divide

‘Object’ and ‘properties’ emerge out of action

Understanding is always from a perspective of a culture or an activity and *necessarily* incomplete

Analysis of Breakdown

Modes of tool user: Ready-to-hand <-> Present-at-hand <-> detached

A useful, practical design aid