

Extended and embodied cognition

Cognition beyond the brain

The extended mind

- Memory
- perception

Eks. kulturel evolution

Matematik:

- Nye notationer gør det vildt meget nemmere. Arabiske tal kan ganges, romerske talsystem er rigtig dårligt til det.
- Arabiske tal gør at alle kan lære det.

Vi forbedre vores biologi ved at bruge ting, der ligger udenfor os selv

Extended mind (philosophical tradition)

- Andy Clark & 1990'erne
- Heidegger

Distributed

- Edwin Hutchins 1990'erne
- Build on ecological psychology
- Latour, Vygotskij og m.fl.

Cognition definitions

- ^{PO}functional
- ontological

Classical computationalism

Perception → Cognition → output
≈ behaviorism, black box

Embodiment theory & representationalism

- strong emphasis on our 'cognitive representations'
- we manipulate representations of the world in our mind

Case: Tetris

★ Manual rotation can be considered a cognitive process

Pragmatic actions

Epistemic actions

- not to change the environment, but to change a cognitive state
- fx. at opdele et matematisk problem i mindre dele, som vi nemmere kan behandle mentalt

"Outloading" mental processes

Expert Tetris players do a lot of manual rotations, while beginners do few.

Perception - Actions loops

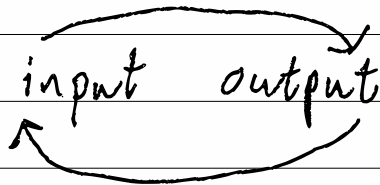
- Slide 17

! ☆ - Clark and Chalmers 1998

- The parity principle

- The world is part of the cognitive process

where input \rightarrow output, men



The brain doesn't do cognition. The brain + it's environment does.

Cognition as a "Coupled System"

- coupling-begreb fra Latour (?)

The manual tool analogy

- Hammeren er en del af dig, når du har den i hånden.

manual tools enhance the action potentials of our biological bodies

Procedural dynamic couplings

✱

Extended Memory

- En hushæseddel er ~~et~~ del af dit kognitive system
- Notebook as an extension of our memory-system

Gestures for thinking

- We spontaneously gesture when we speak, also when we talk on the phone; why?
- because gestures might help our thinking
- Jamalian (2013)
 - Participants use gestures to encode geographical information
 - Dem, der brugte 'gestures' var bedre til at bruge informationen
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Extended perception: Active sensing
We perform a lot of actions to help our perception (fx tilt head, move body etc.)

We usually don't build rich inner models but we use a lot of sensing and use the real world as our "memory"

Active sensing makes a dynamic coupling of world and subject.

Extended executive function

- Sheba experiment (Boysen 1996)
- Se slide³⁴ og/eller løs op på det, ret spændende.
- "Symbols loosen the bond between agent and world". "New target for selective processing"

Types of cognitive extensions

- Replacement of internal processes
- Enhances cognition
- Makes new processes (tenable (?) possible)

Scrabble exercise

- vi lavede par
- Nogle fik en liste med bogstaver andre fik løse bogstave, de kunne flytte rundt på
- Mulighed for manipulation kan have gavnlige effekt



Hutchins (1995)

- Cognitive anthropologist.
- Distributed cognition
- Can be distributed between different agents, artefacts, culture, etc.



Slide 40 Hutchin
I returning at ANT
Cognitive Networks
Objects have agency



The dialogically extended mind

Socially extended mind.

Material representations have
a "public Nature" i.e. allows more
people to think together

Joint thinking

Cognitive enhancement through
social interaction.



Manipulation strongly enhances
cooperation and joint thinking.
Scrabble task

If 2 people have different cognitive strategies they are more likely to complement/enhance each other's performance.

★ Epistemic actions
- Kerne begreb

A less agent/organism-centered theory of cognition (Hutchins)

Confounds

- There are significant differences between internal and external processes
- Coupling-Constitution fallacy
- Cognitive Bloat Objection:
Er ALT bare kognition?
- Mark of the Cognitive fallacy:
Man kan ikke definere det ordentligt

Slidene er rigtig gode!
Brug dem!
Skript