Overview of Distributed Cognition

The logic of empirical science

- A hypothesis IMPLIES observations
  - $H \implies O$
  - Underlying mechanism $\implies$ behavior

A weak inference

<table>
<thead>
<tr>
<th>$H \implies O$</th>
<th>$H \implies O$</th>
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<td>$O$</td>
<td>Not $O$</td>
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<td>$\therefore$</td>
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<td>$H?$</td>
<td>$\not H$</td>
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The only strong inference

What are the mechanisms underlying human cognition?

- PSSH $\implies$ Human cognition?
- Brain $\implies$ Human cognition?
- Supersized mind $\implies$ Human cognition?

"The Computer was made in the image of the human." (Simon & Kaplan, 1990).

AI
Information Processing Psychology
Brain and Body

1. The brain provides soft-assembled control of the body.

Brain, Body, and World

2. The brain provides soft-assembly of mind from resources in brain, body, and world.

Symbolic tools for thinking

2: Nav as comp
3: Nav practice
3. Material symbols

Other material tools for thinking

3: Nav practice
4. World incorporated
6. Cog Impartiality
Retreat to the Brain

5. The “mark of the cognitive” and where the powerful regularities are.

An Alternative computational framework

Emergent Cognitive Properties

Ch 4: SODC
Ch 5: Communication
1. social learning

Teaching

Ch 6: Context of learning

Cultural practices orchestrate the interactions of brain, body, and culturally organized world to produce high-level cognition

Enculturating the Supersized Mind

A cultural flip on Andy Clark’s Extended Mind flip
• Clark delivers the Extended Mind
• What organizes the extended mind?
  – Clark’s trapdoor into the future
• The “mark of the cultural” is everywhere
• The enculturation of the supersized mind

What does a brain represent?
• Nervous systems do not form representations of the world, they can only form representations of interactions with the world.

Where do human brains do what they do?
• For humans the world in which brain and body are situated is cultural.

How do human brains get organized?
• The brain (with the help of cultural practices) can form functional units that represent interactions with cultural patterns,
• functional units that can maintain coordination with cultural patterns.
• and functional units that can, via emulation, imagine those interactions and that coordination.

How do human brains achieve high-level cognitive processes?
• Under the guidance of yet other cultural practices, the human brain can form higher-level functional units that establish coordination among other forming and already formed functional units.
What is the human brain?

- The human brain is a special super flexible medium in which the historical residues of culture can interact.
High-level Cognitive Processes

Nervous System

GOFAI

PDP

Low-level processes

Cognitive Ethnography

Connectionism

Neural Nets

Embodiment

A-Life

Cultural Process

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