

Philosophy 395 Computer Science 228 Symbolic Systems 210	Lecture 8 — An Alternative Account	Philosophy of AI Stanford University Winter Quarter, 1989–90
File path:	Koyaanisqatsi : Philosophy of AI : Phai — 8 — Alternative	
Copyright:	© 1990 Brian Cantwell Smith	
Last edited	Monday, November 15, 1999 — 9:41:40 PM	

I. Introduction

- A. Have shown: we don't yet understand what computation is.
 - 1. Have looked at various claims
 - a. Formal symbol manipulation
 - b. Digital state machines
 - c. Effective functions
 - 2. There are others
 - a. Information processing (tonight)
 - b. Algorithms
 - c. ...
 - 3. More different than they look, and all inadequate
- B. More specifically
 - 1. People can't be like computers, because computers ...
 - a. Operate on symbols formally ...
 - b. Are purely abstract
 - c. Are digital
 - d. Lack requisite causal powers
 - 2. Reading Searle, \Rightarrow CPSR meeting (launch on warning)
- C. Summary
 - 1. Problem with ϕ ers: they believed us — believed what we wrote and said
 - 2. Furthermore, in believing us, missed something crucial
 - 3. Computers actually exist
- D. Historically
 - 1. Computers are darling child of formal tradition (Turing, Carnap, Russel & Whitehead, Frege — back to Gallileo, even Plato)
 - 2. Has tried to treat them as abstract objects
 - 3. In virtue of their existence, they prove that tradition wrong.
- E. So talk about computers that actually exist, and what that portends for intellectual history.

II. Intentionality

- A. Won't spend a lot of time, because already guess

- B. Don't think computation provides an account of intentionality
- C. Rather: other way around
- D. Take computers to be:
 1. Socially constructed intentional artifacts
 2. What "social", "constructed", and "artifacts" means are anyone's guess
 3. But: need a theory of intentionality.
- E. Everything else secondary
 1. Digitality, e.g. \Leftarrow need to derive it, explain why it is relevant, etc.

III. \Rightarrow Berkeley-3

IV. \Rightarrow Berkeley-4

V. Participation

- A. Properties of intentionality
 1. Relational \Leftarrow not intrinsic
 - a. So no brain-o-scopes
 - b. Intentionality not a species of causal connection
 - c. So won't expect content to have causal powers
 - d. Doesn't mean that "thinking something" won't have causal powers; that's
 2. What is intentional?
 - a. \Rightarrow Participation (\neg thinking)
 - b. Not cognitive science!
 - c. First hint about my solution to mind/body problem:
 - i. Isn't mind that we're understanding.
 - ii. Rather, it is what it is to be an intentional being
- B. Textured middle
 1. $\langle 0,0,0,0 \rangle \Leftrightarrow \langle 1,1,1,1 \rangle$
 - a. Note Lewis: takes substrate and continuous to align in his theory of "analog"
 2. Transducers: out the window
 3. World isn't just outside!
 4. Time: participate without sensors.

VI. Coördination conditions

- A. What distinguishes good participation from bad
 1. Logic has this. Need more than just a way of being
 - a. Relation between syntax and semantics
 - b. Cf. alligators.
- B. \Rightarrow **Coördination conditions**

1. Maintenance of invariance, etc.
2. \Rightarrow tracking
3. Overlap: clocks (cf. paper)
4. Rise of objects: stasis conditions in the face of flux.
5. Logic: derive traditional soundness & completeness as "formal" (= utterly disconnected) case. \Leftarrow extremely important

C. Point

1. Intentionality \Rightarrow what allows a fragment of the world to transcend the limits of effective coupling, and stand in relationship to that that is distal.

VII. Other properties

- A. NB: predicate on a way of being \Leftarrow not on end-states (goals)
- B. Direct perception (cf. Neiser), like looming: may not be intentional (therefore not computation). Tough!
- C. Embodiment
 1. Like people: have bodies, but aren't either embodied or bodies directly
 2. Cf. architecture
- D. Indexicality
 1. Comes from the substrate
 2. Cf. physics, magnets
- E. Rise of objects (cf. rise of concepts)
 1. No objects in physics!
 2. Why: need abstraction
 3. Physics, too, deals in properties

VIII. Summary

- A. Story about six-pointed star
- B. Three fundamental properties
 1. In: interaction, located (indexicality), etc.
 2. Of: physically realised (temporal, effective, etc.)
 3. About: intentional participation, registration, etc.
- C. Note on formality
 1. Denial
 - a. A-contextual (cf. Barwise), self-contained, etc.: denies in
 - b. Abstract, medium-independent, digital, etc.: denies of
 - c. Programming-language semantics, digital state machines, etc.: denies about
 2. Cut off from (though admitted)
 - a. asm: from semantics
 - b. digital: from embodiment;

- c. rft: from physicality;
- d. formal-h: from external environment

IX. Consequences for theory and practice

A. Theory

- 1. Calculus of correspondence
 - a. Theory of representation
- 2. AI \Rightarrow below the distinction between people and machines
- 3. Participatory method
 - a. Cf. formality as a predicate on method
 - b. Allegiance of traditional computer science departments

B. Practice

- 1. ...

Q. Questions for Monday night

- Course summary
 - Sources of intentionality:
 - a. computation
 - a. evolution (biology)
 - a. purposes & goals, etc. (can be evolutionary, but needn't be)
 - a. information (counter-factual supporting correlation)
 - a. representation
- Clocks
- Mind/body problem
- Consciousness
- Information Processing
- Semantics, interpretation, and meaning

A. Analogue clocks

- Need to analyse three things:
 1. Mechanics: internal workings
 - Continuity of underlying substrate assumed. (NB: even reverting to quantum effects doesn't help: they don't resonate perfectly, in any sense. Else it would be possible to build perfect atomic clocks, which it isn't.)
 - Mainspring is irrelevant (similarly: battery in a calculator)
 - Depends on type:
 - Synchronous AC: digital
 - "Clockwork" (tension spring, pendulum, etc.): digital from escapement on
 - Quartz: digital
 - Could be others, that are genuinely analog (like an hourglass), but I doubt it.
 - Main point is that, beyond a certain point ("beyond" is wrt the causal chain) it is digital.
 - This is crucial: is what allows the weight of the arms, etc., not to influence behaviour. In fact arguably this was the crux of the invention of the modern clock: a way to get digitality in all but an isolated subsection. So all the stuff about moving the hands, the energy source, etc., could (largely) be isolated from the resonant part.
 - Can either be at the level of the clock works itself (per second, i.e., in which case the clock noticeable "ticks"), or at a lower level of implementation (obvious is the quartz case). Still, what we said about

the reason for digitality remains: achieves perfection, removes vulnerability to buffeting external influences.

2. Syntax: what people actually read it as indicating
 - Hour and minute hands: h-digital (cf. Goodman). Note: this digitality is orthogonal to the digitality of the workings.
 - Second hand: could be either continuous or digital (ticking). Depends on approximation. But see mechanics.
3. Semantics: representation relation
 - Lewis
 - Only thing to which the Lewis notions apply
 - On the one hand, seems to fit Lewis's notion of "direct magnitudes" (of hands), \Rightarrow analog-L
 - On the other hand, given complex of three hands, given that two are differentiated magnitudes, a "differentiated multidigital magnitude", hence digital-I?
 - Ordinary semantics (i.e., interpretation relation) is either continuous or discrete, depending on whether the syntax is continuous or discrete.
 - Therefore, unlike the calculus, which has discrete syntax, but continuous interpretation.
 - More complex, though, is the issue of accuracy.
 - I.e., not what time it says it is, but whether it is the time that it says.
 - Disconnection etc.: standard issue of measure: connected to subject matter, but disconnected from unit. Therefore, marks the passage of time, but measure is subject to inaccuracy.
 - Isolation of the temporality of the inner resonance from the workings of the rest of the clock.
- Other
 - Cf. FM, records vs. CD's, etc.
 - In brief:
 - H and M hand's: interpreted discretely, but work continuously (implemented on a discrete substrate, for accuracy!)
 - S hand: interpreted continuously, but works discretely (in some cases; in others, implemented on a discrete substrate).

—end of file —◆◆