Four views of computing: disciplinary, cultural, philosophical & historical

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Perspectives

1. Disciplinary
   a. The humanities
   b. The sciences

2. Cultural

3. Philosophical

4. Historical
1. **Disciplinary**

1. Origins of computing in a mathematico-philosophical problem, thus involving both sides of the two-cultured divide;

2. What was new: convergence with practical action → the methodological/bureaucratic machine;

3. Nearly coeval applications in the sciences and the humanities;

4. Different paths of development in part a function of differing trajectories of the sciences and humanities;

5. Hence as an historiographical & philosophical orientation to the disciplinary question, we need to be able to characterize the divide.
1. Disciplinary

- Sciences vs humanities

1. **Nomothetic vs idiographic**
   (Wilhelm Windelband, philosopher, 1848-1915);

2. **Logical vs psychological**
   (Hermann von Helmholtz, physicist, 1821-1894);

3. **Detached vs involved**
   (Carlo Ginsberg, historian, 1939-);

4. **Distant vs up close**
   (Clifford Geertz, anthropologist, 1926-2006);

5. **Singular vs plural**
   (Jerome Bruner, psychologist, 1915-).
1. Disciplinary

1. Nomothetic vs idiographic (Windleband)

♦ Nomothetic (Gk, nomothetikós, “relating to legislation”): relating to or concerned with the study or discovery of the general laws underlying something.

♦ Idiographic (Gk, ídio-, “own, personal, peculiar, separate, distinct”; -graphikós “concerned with description”): relating to or concerned with the study or description of individually distinct entities.

1. Disciplinary

2. *Logical vs psychological* (Helmholtz)

♦ “The natural sciences are for the most part in a position to reduce their inductions to sharply defined general rules and principles; the moral sciences, on the other hand, have, in by far the most numerous cases, to do with conclusions arrived at by psychological instinct.”

1. Disciplinary

♦ *Detached vs involved* (Ginzburg)

♦ When Galilean science entered the picture “two roads were open: either sacrifice knowledge of the individual element for generalizations… or attempt to develop, even if tentatively, a different paradigm, founded on scientific knowledge of the individual…. The first course was taken by the natural sciences, and only much later by the so-called humane sciences. The reason for this is clear. *The tendency to obliterate the individual traits of an object is directly proportional to the emotional distance of the observer.*”

1. Disciplinary

♦ *Distant vs close* (Geertz)

“by then perhaps a thousand years old, [it] still had a sharpness of definition extraordinary even for Morocco, where everything seems outlined in calcium light…. The town, the oasis, the mountains, each enclosed within the next, chalk white, olive green, stone brown, each marked off from the next by a line so sharp as to seem drawn with a pen, gave a sense of deliberate arrangement. Site and settlement looked equally designed. The initial effect of going on then to descend into the body of the town was, for a foreigner anyway, the total, instantaneous, and, so it seemed for an uncomfortable period, permanent dissolution of this sense of clarity, poise, and composition…. The double image, clarity from a distance, jumble up close set a frame of perception and understanding, a Jamesian hum of buzz and implication, that could not afterward be wholly discarded, only critiqued, developed, filled out, moralized upon, and brought to bear on more exact experiences.”

“Towns”, in *After the Fact* (1995: 11f)
1. Disciplinary

♦ *Singular vs plural* (Bruner)

♦ “Science attempts to make a world that remains invariant across human intentions and human plights…. The humanities seek to understand the world as it reflects the requirements of living in it…. The one, science, is oriented outward to an external world; the other, inward toward a perspective and a point of view toward the world.” Both “are constrained in the kinds of hypotheses they generate”, the one by testability in physical experiment, the other by the condition “that they be recognizable as ‘true to conceivable experience’: that they have verisimilitude…. For the object of understanding human events is to sense the *alternativeness of human possibility*.”

“Possible Castles”, in *Actual Minds, Possible Worlds* (1986): 50-3, my emphasis.
1. Disciplinary

♦ Sciences vs humanities
♦ Nomothetic vs idiographic;
♦ Logical vs psychological;
♦ Detached vs engaged;
♦ Distant vs close;
♦ Singular vs plural.
1. Disciplinary

♦ But where does computing fit in?

♦ Distinguish “computing” (the action, activity or practice of using a computer) from “computation” (the science of the computable);

♦ Define “computing” as a convenient onomastic tag for the plurality of computings rather than as the name for a common process.

♦ Computing fits in everywhere, but everywhere it fits it’s a different computing!
1. Disciplinary

♦ The perspective from the humanities:

♦ Descriptive. What sort of computings do our best theories and practices require in order to study the artefacts?

♦ Analytical. How do the anomalies left by computational modelling illumine our unknown ways of knowing what we know?

♦ Synthetic. How can we model for an artefactual “inner standing point” so that we can understand our encounters with cultural artefacts?
1. Disciplinary

♦ The perspective from the sciences:

♦ Descriptive. What sort of computings are required by theoretical and experimental work?

♦ Analytical. How can theories be rendered as algorithms in order to illumine regularities in the data?

♦ Synthetic. How can we simulate unreachable or unobservable phenomena in order to study them?
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2. Cultural

♦ “Culture is ordinary” (Raymond Williams, 1958);

♦ Computing is manifold and (nearly) ubiquitous (in urban environments);

♦ “In designing tools we are designing ways of being” (Winograd and Flores 1986);

♦ The primary importance of computing for culture is its synthetic, world-building aspect;

♦ Culturally it is behind the scenes, just as neurological processing is “behind the seen” (Zeki 1995) – and the heard, felt and tasted too.
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3. Philosophical

♦ Distinguish the philosophy of computing from the philosophical perspective on computing (remembering its plurality).

♦ In the former, nominal sense, the philosophizing is a matter of professional and specialized practice, a “philosophy of”, e.g. the philosophy of biology. Philosophies of focus on one or more “central questions” (Colburn 2000). They are bi-disciplinary.

♦ In the latter, adjectival sense, the philosophizing is as limitless as computing itself and inclusive of all disciplined reflective reasoning of whatever style (analytical, phenomenological & al.). It is a perspective rather than a professional specialism.
3. Philosophical: a philosophy of
Timothy Colburn, Philosophy and Computer Science (2000)

Part I Philosophical Foundations of Artificial Intelligence
2 The Definition and Scope of AI
3 AI and the History of Philosophy
4 AI and the Rise of Contemporary Science and Philosophy

Part II The New Encounter of Science and Philosophy
5 AI and Logic
6 Models of the Mind
7 Models of Reasoning
8 The Naturalization of Epistemology

Part III The Philosophy of Computer Science
9 Computer Science and Mathematics
10 Two Views of Computer Science
11 Abstraction in Computer Science
12 Software, Abstraction, and Ontology
3. Philosophical: a philosophy of computer science

Colburn's scheme

Figure 21. A Taxonomy of Philosophy
3. Philosophical: a *philosophy of*

Part I: Four Concepts

1. Computation
   B. Jack Copeland

2. Complexity
   Alastair Urquhart

3. System: An Introduction to Systems
   Klaus Mainzer

4. Information
   Luciano Floridi

Part II: Computers in Society

5. Computer Ethics
   Deborah G. Johnson

6. Computer mediated Communication and Human Computer Interaction
   Charlie Es

7. Internet Culture
   Wesley Cooper

8. Digital Art
   Dominic McIver Lopes

Part III: Mind and AI

9. The Philosophy of AI and its Critique
   James H. Fetzer

10. Computationalism, Connectionism, and the Philosophy of Mind
    Brian P. McLaughlin

Part IV: Real and Virtual Worlds

11. Ontology
    Barry Smith

12. Virtual Reality
    Derek Simsverks

13. The Physics of Information
    Eric Steinhart

14. Cybernetics
    Roberto Casadechi

15. Artificial Life
    Mark A. Boden

Part V: Language and Knowledge

16. Information and Content
    Jonathan Cohen

17. Knowledge
    Fred Adams

18. The Philosophy of Computer Languages
    Graham White

19. Hypertext
    Thierry Bardini

Part VI: Logic and Probability

20. Logic
    G. Aldo Antonelli

21. Probability in Artificial Intelligence
    Donald Gillies

22. Game Theory: Nash Equilibrium
    Cristina Bicchi
3. Philosophical: a *philosophy of*

Floridi’s scheme

Figure 21. A Taxonomy of Philosophy
4. Philosophical: perspectives

♦ What are the philosophical questions?

♦ **Ontological**: *what is computing, or more specifically, what is software?* (Colburn 1999) → the “software crisis” and how to construe software as science for the purposes of studying its effects (Mahoney 2002).

♦ **Epistemological**: *how do we know what we somehow know of the world?* → comparative study of the difference between the algorithmic and the intuitive;

♦ **Ethical**: *what is ethical in a virtual world, i.e., what is computer ethics?* (Moor 1985) → “analysis of the nature and social impact of computer technology and the corresponding formulation and justification of policies for the ethical use of such technology”; how the difference of computer technology “makes a difference in ethical considerations”.
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4. Historical

♦ Historiographical problems related to computing

♦ **Chronology to history**: how to see the apparent facts of the matter as *explicanda*;

♦ **Narration of progress to exploration of archaeological strata**: “an attempt to return the past to the past’s own present, a present with all the possibilities still in it, with all the consequences of actions still unknown” (Dening 1998: 48; cf. Zielinski 2006)

♦ **Conventional to ethnographic history**: how to write a history of such recent things (McCarty 2004).
4. Historical

♦ Relation of computer science to the disciplines, e.g. of the humanities

♦ Strong affinity of concerns shared by computer science and the humanities, which goes back as far as one wishes to seek for it.
♦ Practitioners in the disciplines have collaborated for ca the last 40 years.
♦ Thoughtful people on both sides have been thinking about the relationship for almost as long.

♦ Nevertheless, recent events show a deep ignorance of the nature of this affinity, and humanists show an equally deep (but explicable) ignorance of methodology.

♦ Even the most primitive of historical reflections show that the perspectives outlined here are vital to progress in computing.
Bibliography


