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Book Review

Luciano Floridi, *Philosophy and Computing: An Introduction*, Routledge, 1999.

Luciano Floridi's *Philosophy and Computing: An Introduction* is a survey of some important ideas that ground the newly emerging area of philosophy known, thanks to Floridi, as the philosophy of information. It was written as a textbook for philosophy students interested in the digital age, but is probably more useful for postgraduates who want to investigate intersections between philosophy and computer science, information theory and ICT (information and communications technology). The book is divided into five independent chapters followed by a worthy, though impressionistic, afterthought under the title of the conclusion.

Chapter One, "Divide et Computa: Philosophy and the Digital Environment," begins by outlining four topics to consider when examining the significance of the digital revolution: 1) computation, 2) automatic control, 3) modeling and virtual reality, and 4) information management. This preliminary outline is followed by a brief historical consideration of the transition from analogue to digital information processing and the importance of "digitization" for developing mechanical means to manage information. According to Floridi, this digitization has occurred in three main areas. Regarding the scope of digitized content, we have moved from numerical data to sounds and images. At the same time, our interfaces to the computer have become less digital and more humane. Graphical user interfaces and WYSIWYG software have quickly replaced punch cards. In the area of connectivity, we have moved from the mainframe to the Internet, hence, to the possibility of a global information network. Together these transformations are accelerating the evolution of the infosphere and consequently its dramatic effect on the shape of society. These changes are of world historical significance, thus worthy of philosophical investigation, as the last part of the chapter shows. Already philosophers are responding to these important developments, particularly in the areas of Information and Management Systems Methodology, Formal Ontology, The Metaphysics of Virtual Reality, The Epistemology of Computing, The Philosophy of Artificial Intelligence, Computer Ethics, The Philosophy of Artificial Life, The Philosophy of Computer-Mediated Communication, and Artificial Morality. Together these areas are unified by Floridi under a preliminary definition: "… the philosophy of information is primarily concerned with the whole domain of phenomena represented by the world of information, and inclines towards a metatheoretical approach only in so far as it addresses the philosophical problems implicit in the world of information by starting from the vantage point represented by information science, computer science and ICT" (18).

Chapter Two, "The Digital Workshop," presents some computer basics. It begins with a discussion of some early computational machinery, including analogue devices such as water clocks and thermostats, and the analytical engine of Charles Babbage. This brief introduction is followed by a lengthy and difficult treatment of Turing Machines that contains the important elements of Turing Machine computation. The limitations of the Turing Machine are briefly treated at the end of this section in order to make room for the important application of Boolean algebra to computation and the innovations of von Neumann respecting the modern computer's architecture. This leads to a helpful discussion on the basic architecture of programming lan-

guages that illustrates why they are essential and important for the recent transformations in the infosphere. The chapter ends by looking at the various types of computers, both commercial and personal. As a whole, this survey of the history of computation and its mechanization is reasonably complete. The main issues are here. But, as the informed reader will suspect, this is a lot of ground for anyone to cover in just 25 pages. Floridi tries, but the sheer scope of material summarized in such a short space and an awkward use of symbolic notation makes the story a bit unclear. This criticism is local, however, and should be restricted to some sections of chapters two and five. The middle chapters are quite clear, and since these chapters provide what is revolutionary, the book as a whole does not suffer much because of a few dense sections.

In Chapter Three, "A Revolution Called Internet," Floridi summarizes the history of the Internet, defines its various dimensions and addresses its potential impact on the "human encyclopedia". After a brief history, the book considers the Internet as "the totality of three different spaces: the infrastructure (the physical dimension), the memory platform (the digital dimension), [and] the semantic space (the cyberspace dimension)" (61). The division is fair and necessary to ground the difference between the physical network and the arrangement of information on this network. Indeed, it is precisely this difference that makes the Internet useful as a vehicle of information arrangement and transmission. This analysis is followed by a catalogue of some of the uses of the Internet, such as E-mail, Bulletin Board communities and the World-Wide Web, along with some analysis of their significance as communications tools. The chapter then briefly considers the potential effects of the Internet on organized knowledge.

Chapter Four, "The Digital Domain: Infosphere, Databases and Hypertexts," was this reader's favorite, largely because it goes a good way toward establishing a philosophy of the database. Though talk of such things might initially sound like the stuff of computer science, those who study canonical philosophy will find themselves on familiar ground. The chapter appeals to recognizable thinkers such as Plato, Aristotle, Kant and Hegel, and even includes a section called "the aesthetic and the ontological interpretation of databases." After a philosophical and historical introduction, the chapter considers the relationship between the database and the encyclopedia, followed by a comprehensible definition of the database and an outline of its various types. Mid-way through the chapter, the reader will find an interesting discussion of the difference between data, information and knowledge. The section is a gloss, as Floridi admits, but enough is said to differentiate between three concepts that are often conflated in ordinary speech. This differentiation sets the stage for several subsequent sections that head in the direction of what might be called information engineering.

The chapter continues with a very brief look at a few issues in computer ethics, such as "Rich and Poor in the Information Economy" and a short enumeration of issues such as the standardization of the infosphere, data security, copyright infringement, privacy and pornography. This interlude into ethics is followed by a rich and lengthy discussion of what may be the most important element of modern information arrangement, hypertext. Here, Floridi dives deeply into analysis. Hypertext is defined as an information retrieval system made up of "a discrete set of semantic units," "a set of associations," and "an interactive and dynamic interface" (119-120). These concepts are together clarified by considering seven provocations that Floridi labels as "fallacies" and that are worth quoting here.

> (1) The *electronic fallacy*: hypertext is a uniquely computer-based concept.
> (2) The *literary fallacy*: hypertext began primarily as a narrative technique and hence it is essentially a new form of literary style.

(3) The *expressionist fallacy*: hypertext has arisen as and should be considered primarily a writing-pushed phenomenon.
(4) The *"politically correct" fallacy*: with hypertext, the reader is in complete control of whatever contents or functions are available and hence is no longer subject to the writer's authority.
(5) The *obsession with the rhetoric of syntax*: hypertext is non-linear writing and challenges the book-ish assumption that contents have to be presented in a linear fashion.
(6) The *mimetic fallacy*: hypertext mimics the associative nature of the human mind and therefore is better suited to its activities.
(7) The *methodological fallacy*: hypertext will replace printed books. (120-128)

Chapters Three and Four are insightful. Here, Floridi is doing something that I have yet to see done elsewhere: he analyzes the data structures that are emerging because of the Internet and electronic databases and considers their impact on the organized body of knowledge from a philosophical perspective. He rightfully implies that issues of information arrangement do belong in philosophy and are as intrinsic to it as metaphysics and epistemology.

Chapter Five, "Artificial Intelligence: A Light Approach," however, is a bit of an anomaly. It is a full one-third of the book, yet seems to be more of a summary addendum tacked onto the end. It includes much of the standard AI introductory material, discussions of good old-fashioned AI, the Turing Test and its limitations, the various areas of AI application, light AI, fuzzy logic (another very difficult section along with the section on the Turing Machine mentioned above), neural nets, parallel computing, quantum computing, expert systems, robotics and cybernetics. But even at eighty pages, the text moves very quickly. It is packed with information; yet, it is a summary that will perhaps best be appreciated by those already familiar with the issues.

The concluding section is a playful step back from the rigorous detail of the rest of the book. It raises some issues of interest to those who study human nature and would like a jumping off point for thought on the relationship between what is happening to us informationally and what this might mean for our destiny as a species. As a hint, the reader of this review might appreciate the following quotation:

> The history of human emancipation has been, so far, not devoid of success. Nature, animals, technological devices and the labour of other human beings have all been employed to transform energy into force and to manage information. The paradox of the industrial and the information revolutions, however, is that in both cases the fundamental anthropological project seems to have failed, although nothing should have been more successful than the engine and the computer in sanating (healing) and liberating human time, developing *homo faber* into *homo sapiens* and then bringing both closer to extinction in favour of *homo ludens*. (221-222)

Provocative and short, the conclusion itself asserts a thesis that could well be a theme for another book.

Now here are some remarks for a general review of the book as a whole. With this book, Floridi has attempted a very difficult task. He starts the book with an acknowledgement of the difficulty that comes with writing any philosophy textbook: "We expect the author to introduce all the basic elements in the field clearly and succinctly, while providing an interesting perspective from which to interpret them fruitfully. This doubles the chances of getting things wrong and generates a paradoxical tension between originality and lack of novelty" (ix). We can imagine that this situation is all the more complicated when one attempts an introductory textbook for a field of study that is in its infancy, as is the philosophy of information. Floridi is hard at work in his other writings to outline what a philosophy of information should entail and is still defining its initial terms. This may partly explain why the book moves along so clearly with insight and

innovation in some places and why it bogs down in others, particularly where it tries to summarize a vast amount of established material in a small space.

The book is at its best where Floridi is most creative. Chapters Three and Four, on the Internet and databases, respectively, breathe easily and read well, along with offering some much needed and innovative assessment. Floridi is right to want to introduce the technical aspects of digital computation and the Internet into the manifold of philosophical problems, and these two chapters go along way in setting the stage. Even by themselves, these two chapters make the book well worth reading, though the more historical sections are worth the review.

I would recommend the book as a transitional text for professionals interested in moving from the traditional issues of computation and AI into the analysis of more recent developments in information storage, retrieval and organization brought about by the Internet. The book is rich in detail, and the catalogue of facts enumerated along the way is well worth having at one's disposal. It is a *must read* for anyone interested in the intersection between philosophy and the new computational climate that is emerging with the Internet. Additionally, the scholarly-minded will appreciate the scope of the research that lies behind this work as indicated in its extensive bibliography.

Anthony F. Beavers, The University of Evansville