Luciano Floridi: Mastermind of Information Philosophy

George O. Strawn, *National Academy of Sciences, Engineering, and Medicine*

Information *Philosophy*?! Many people will say, "I thought the age of philosophy was long gone, and that we are in the age of science." Indeed, philosophy has had a "bad name" among scientists and others for a century or more. Starting in 1900, science moved so far ahead of philosophy that many people thought it was gone for good. Even many philosophers greatly reduced the scope of their subject in response to this criticism. But now an increasing number of people are saying that any scientist who says he does not have or need a philosophy probably has a unconscious, three-hundred-year-old, defunct philosophy! An example of a defunct philosophy is that the world consists of "matter in motion," which was the way it looked in 1700 after Issac Newton created the laws of motion and gravity. However, quantum mechanics, general relativity, biology, complexity theory, and other scientific advances have shown that this philosophy needs be retired, unless all we are interested in is unexplainable technological advances. That approach to science has been called "shut up and calculate!"

Into this complicated world comes Luciano Floridi (1964-), an Italian who is now a Professor with Oxford University in England.[1] He has focused on creating a new philosophy based on our field of information. Given his work and that of several others, we may be in the process of seeing the technology of information joined by the *philosophy of information* (PI).[2] I will begin by relating some information about Floridi himself, then give an overview of (part of) the philosophy of information, and conclude with some comments about, "so what?"

LUCIANO FLORIDI

When I said above that Floridi was a Professor with Oxford, I was being rather stingy. More completely, his Wikipedia article says that he is a "Professor of Philosophy and Ethics of Information and Director of the Digital Ethics Lab, Oxford Internet Institute, Professorial Fellow of Exeter College, Senior Member of the Faculty of Computer Science, Research Associate and Fellow in Information Policy at the Department of Computer Science, and Distinguished Research Fellow of the Oxford Uehiro Centre for Practical Ethics. He is also Adjunct Professor ("Distinguished Scholar in Residence"), Department of Economics, American University, Washington D.C. He is Turing Fellow and Chair of the Data Ethics Group of the Alan Turing Institute.[1] "If I also listed his awards and honors, I would have no room left for the rest of this article.

Floridi completed his undergraduate education in Rome where he studied the history of philosophy. In graduate school at the University of Warwick in England, he became interested in logic and *analytic philosophy*, which in fact is the "reduced scope" of philosophy that I mentioned above. But after graduate school he decided that "analytic philosophy had lost its way," and he turned his attention to *pragmatism* (an American contribution to philosophy), which assesses the truth of a theory in terms of the success of its practical implications. And also *epistemology*, which is the study of knowledge—how we can distinguish fact from opinion. Many of these words and areas of study may be unfamiliar to IT professionals, but the area of information *ethics* is very familiar to us (more on that below).

Floridi has written for an interested public as well as for his fellow philosophers. In the first category are books such as *Information: A very short Introduction*[3] and *The Fourth Revolution*,[4] both of which I can personally recommend. In the second category, he has authored the first three of a tetralogy of "serious" books: *The Philosophy of Information*, *The Ethics of Information*, *The Logic of Information*, and *The Politics of Information*.[5–8]

FOURTH REVOLUTION AND HYPERHISTORY

I have read a number of different ways that revolutions are used to structure our view of history, all of them are interesting and helpful. Floridi uses four scientific revolutions in the last 500 years to show how we humans have been increasingly "demoted" in our self-importance: the

1520-9202 © 2021 IEEE
Digital Object Identifier 10.1109/MITP.2021.3057244
Date of current version 19 August 2021.

Copernican Revolution demoted us out of the center of the universe; the Darwinian Revolution demoted us out of a unique creation; the Freudian Revolution demoted us from rational beings to ones driven by subconscious emotions. Now the Information Revolution has demoted us to being less smart than our machines. Of course, "demotions" is a tongue-in-cheek way to describe great scientific advances in understanding. And Floridi's point is that IT and Information are in the process of not only changing the way we live, but also the way we conceive of ourselves.

The way we live has changed radically over time. From the very long period of hunting and gathering, to a shorter period of farming, to a very short period of city dwelling, Floridi suggests we are now moving into the *infosphere*.

Using standard nomenclature, the period before written language is called *prehistory* and the period since then (about 5000 years) is called *history*. Using Floridi's new nomenclature, we are now entering *hyperhistory,* which is arriving as information technologies assume a central place in determining how we live. This required the very recent arrival (75 years) of computed language/information, not just information storage and retrieval.

PHILOSOPHY OF INFORMATION

What is information? I expect many of us would say, "I know it when I see it," and let it go at that. Even Donald Knuth, avoids the question in *The Art of Computer Programming,* where he defines algorithms and information structures, but not information. In a previous column,[9] I discussed "Shannon information," which is all about verifying that "the bits that you sent are the bits that are (efficiently) received." This is extremely important both within a computer and between computers, but it is not *meaningful* or *semantic* information, which is the focus of Floridi's work. Right from the start, he demonstrates the benefit of careful (philosophical) thinking as he defines *four types* of meaningful information, which are often confused: Information *about/as/for/in* something. For example: information *about* a train schedule; information *as* DNA information; information *for* an algorithm; information *in* something, such as a pattern in big data. Assuming we now "know" what information is, what is the philosophy of information?

PI is a branch of philosophy that studies topics relevant to computer science, information science, and information technology. It includes a) the critical investigation of the conceptual nature and basic principles of information, including its dynamics, utilization, and sciences, and b) the elaboration and application of information-theoretic and computational methodologies to philosophical problems.[2] Note the two-way street: PI uses philosophy to study information and uses information to study philosophy!

Our standard hierarchy of data, information, and knowledge get special treatment from Floridi. As usual, data are uninterpreted bits. Semantic Information is well-formed, meaningful, and true data, as opposed to data with metadata as a computerist might say. Floridi believes that we humans are the *only* "semantic engines," so it is we ourselves that can turn data into information. Finally, knowledge is relevant semantic information, properly accounted for. He says further that, "*knowledge is design*, and that philosophy is the ultimate form of conceptual design." If knowledge is design, then building an information *model* of a system is one type of design, and making a *blueprint* for a system that does not exist yet is another. With these terms at hand, Floridi defines his work as, "constructionist study of the use of semantic information as model and blueprint."

As a last look at PI, Floridi uses the four components describing Shannon information: the sender, the message, the channel, and the receiver, to describe four misconceptions that his work is designed to counter. First, epistemology (the study of knowledge) focuses too much on the receiver when it should be concerned with the sender because knowing is constructing. Second, ethics focuses too much on the sender when it should be concerned with the receiver because the keys to being good are care, respect, and tolerance. Third, metaphysics (abstract concepts) focuses too much on the sender and receiver when it should be more concerned with the message. Fourth, logic focuses too much on channels as justifying our conclusions when it should be concerned with channels as allowing us to extract and transfer information from a variety of sources reliably.

SO WHAT?

As mentioned above, Floridi's double goal is to have information affect philosophy and philosophy affect information. Readers of this column are likely to be more interested in the second goal. If the PI can throw light on, for example, information ethics it could help us solve some of its considerable problems. Of course, system design is where software projects begin, so if "knowledge is design, and philosophy is the ultimate form of conceptual design," our general processes of system design might also be clarified.

One personal takeaway for me is related to the important concept of semantics. I have tended to think of subjects such as natural language processing and the Semantic Web as endowing our software systems

with a certain level of "machine understanding." Floridi leads me to refine my thinking and look at such software as making it easier for us to use our personal "semantic engines" rather than think that any machine semantics is created.

Since I have an amateur's interest in philosophy, I will probably see how much of his "serious" work I can understand. He refers at one point to a philosopher who wrote about a troubling relationship that people and technology (not just information technology) can fall into.[10] For two hundred years, humanity has been inventing the most spectacular technologies, which have changed the world more in those two hundred years than it changed in the previous two thousand. Such progress can lead some people (such as we technologists) to see the world composed of only two worthwhile activities: inventing new technologies and selling/using them. Technologies certainly have made our lives more productive, easier, and longer. But we should be careful to distinguish between means and ends as we all seek the good life.

REFERENCES

1. L. Floridi, Dec. 31, 2020. [Online]. Available: https://en.wikipedia.org/wiki/Luciano_Floridi
2. Dec. 27, 2020. [Online]. Available: https://en.wikipedia.org/wiki/Philosophy_of_information
3. L. Floridi, Ed. *Information: A Vert Short Introduction*. Oxford, U.K.: Oxford Univ. Press, Feb. 25, 2010.
4. L. Floridi, Ed. *The Fourth Revolution*. Oxford, U.K.: Oxford Univ. Press, Jun. 26, 2014.
5. L. Floridi, Ed. *The Philosophy of Information*. Oxford, U.K.: Oxford Univ. Press, Mar. 1, 2013.
6. L. Floridi, Ed. *The Ethics of Information*. Oxford, U.K.: Oxford Univ. Press, Oct. 8, 2015.
7. L. Floridi, Ed. *The Logic of Information*. Oxford, U.K.: Oxford Univ. Press, Jan. 21, 2019.
8. L. Floridi, Ed. *The Politics of Information*, to be published.
9. C. Shannon, "Mastermind of Information Theory," *IT Prof.*, vol. 16, no. 6, pp. 70–72, 2014.
10. Jan. 8, 2021. [Online]. Available: https://en.wikipedia.org/wiki/The_Question_Concerning_Technology

GEORGE O. STRAWN is the Director Emeritus of the NAS Board on Research Data and Information. Prior to joining the Academy, he was: the Director of the Federal National Coordination Office for the Networking and IT Research and Development; NSF Chief Information Officer; the Executive Officer of NSF/CISE; Director of the CISE Division of Advanced Networking Infrastructure and Research; NSFnet program officer; Iowa State University Director of the Computation Center; Chair of the Computer Science Department. Contact him at gostrawn@gmail.com.