Codes of Ethics and Their Limitations

Computer Ethics: A Global Perspective. *By Giannis Stamatellos, Jones and Bartlett, Boston, 2007, 160 pages, $34.95.*

Wir sind von Kopf bis Fuß
Auf Computer eingestellt
Denn das ist unsere Welt
Und sonst gar nichts.

From head to foot
We are enmeshed by the computer
This is our world
Beyond it we don't exist.

—From *The Blue Angel* (my alterations of Marlene Dietrich's famous song)

Some things in life are independent of the computer, of course, but it is getting harder to find them. The computer—based, in my view, on symbolisms of a mathematical nature—represents the greatest social triumph of the mathematical spirit since the Babylonians were toting up prices of goats and onions on cuneiform tablets.

BOOK REVIEW
By Philip J. Davis

Every technological innovation has its downside. This is the message of the myth of Prometheus, who stole fire from the gods and gave it to the humans. From the beginning of the Industrial Revolution, people questioned the value of technological progress. Later, we saw the message in the well-documented agony of J. Robert Oppenheimer. We see it clearly today in our love affair with automobiles. I wonder whether there is any area of technological progress and improvement that has only an upside: perhaps in medicine? But even in medicine—though our lives are, on average, healthier and longer—reports of the downside of medical progress can be found every day in the newspapers.

Giannis Stamatellos teaches at the Doukas School in Athens and has given courses on computer ethics in a variety of places. He has divided his book into Ethical Issues (Part A) and Social Impact (Part B).

In Part A, Stamatellos gives us a long list of acts and attitudes constituting computer abuses. We have theft of money, of information, of goods and services, of identities. The hackers are out there spreading viruses and worms, invading in Trojan horses, depositing cookies and logic bombs. Privacy is breeched, intellectual property is stolen, misrepresentations and falsehoods are implanted via automatized taxonomies or, even worse, via hard-to-detect simulations. Security is destroyed, cyberterrorism emerges, individuals suffer dehumanization in that they exist only insofar as the computer verifies their existence. Very likely, most of these abuses are known to readers, some of whom may have been victimized. Very likely, new talents will find additional ways to push the envelope in ways that will make us scream.

Because computer misuses are not as immediately lethal as some of these abuses, we tend to an extent to overlook them, even though they can lead to litigation and, ultimately, to consideration by the Supreme Court. (In 2005, for example, the U.S. Supreme Court ruled against file swapping.) But computerization has proceeded with such rapidity that policy vacua are as plentiful as potholes after a hard winter. Legislators and judges are at sea when it comes to penetrating the arcane reticulations of computer practices and language and fitting human ambivalences and conflicted desires into traditional legal frameworks. The law is hard pressed to plug the holes.

Educated within a culture in which all mathematical developments were available to all and free of charge, I was initially shocked when software, which I regarded as essentially mathematical algorithms, began to carry a price tag. A joke then current was that we would soon be paying royalties to Gödel's estate each time we cited his theorem. Yes, I want privacy where I want it, and I want openness where I want it. I am conflicted, as we all are. And mea culpa, I have downloaded, photocopied, and simulated to suit my personal convenience and without knowing or attempting to determine whether compensation was demanded.

In the second part of the book, Stamatellos surveys the social impact of "intelligent" machines, of computers in business, health, education, politics, and entertainment. In each of these areas Stametellos briefly and succinctly lists upsides and downsides, saying, in essence, "You be the judge." Indeed, society judges the balance: If the price we pay for automobilization is so many deaths and injuries per annum, and the concomitant dollar costs are such and such, do we still want it? A resounding "yes" is heard in the land. Occasionally, the whistle is blown so strongly that effective bans are put in place. The ban on DDT comes to mind. In all of these technological installations that have downsides, the public decides either by support or rejection what it will put up with. So also with computers.

Could John von Neumann have foreseen this moral morass when he pushed for an electronic computer (ENIAC) to be used for numerical weather prediction? Could Vannevar Bush have foreseen the downside of providing humans with instant access to a total accumulation of so-called human knowledge and wisdom? I doubt it. Will the touted and seemingly indispensable Information Highway morph into the "Boulevard of Broken Dreams"? It is not easy to fore-tell the long-term human consequences of mathematical techniques and of technological developments. Call this the "butterfly effect" of cyberethics.

What to do? Norbert Wiener, in *The Human Use of Human Beings* (1950), written out of his immersion in feedback mechanisms, was one of the first to confront the problem of computer ethics and sound a warning. Well, let's promulgate ethical codes. Let's declare standards, guidelines, limitations, write laws, construct fire walls, targeting specific groups with them. Codes confront group members with criteria, with an ideal. Such criteria have evolved slowly from our experiences with our *old* tools, and we have extrapolated, applying those criteria to situations

and constructions that are entirely new on earth. But the human brain is absolutely marvelous in its cunning inventiveness and ability to circumvent such guidelines. Or perhaps I have it a bit backward: Maybe the first step is some new kind of action involving computers, to which the public, waking slowly from its dream of computer guiltlessness, says No, no. Then come the codifiers, inserting, say, bullet 2.14 into their codes.

The Code of Hammurabi (mid-1700s BCE) is the first written code of law and behavior that we know of, and it was carved in stone. Today, there is a database that lists thousands of codes promulgated by thousands of special-interest groups. (There are, for example, codes of etiquette and dress for golf courses.) Do such codes—which are absolutely necessary—do any good? Yes and no. How can they be enforced? The Law of the Land sets forth codes of ethical behavior even as corruption is rife and the jails burst their seams.

Finally, I come to mathematics, both pure and applied. In 2005, the American Mathematical Society, after much debate as to wording, published an updated code of ethics for its members. SIAM does not have such a code—in part, I believe, because of the disparate nature of its membership, which includes mathematicians, computer scientists, engineers, physicists, etc. Though the boundary is blurred, one can distinguish between internal and external considerations and then think about the possibility of ethical codes in the practice of mathematics. The AMS code of ethics relates largely to internal behavior; two points in that code caught my eye:

"Freedom to publish may sometimes yield to security concerns, but mathematicians should resist excessive security demands, whether by government or private institutions."

The fuzzy word here is "excessive." In the World War II era, people used to joke that the binomial theorem had been stamped confidential.

The second noteworthy point is:

"When mathematical work may affect the public health, safety or general welfare, it is the responsibility of mathematicians to disclose the implications of their work to their employers and to the public, if necessary."

Good, but it is exceedingly difficult to judge the future effects of a mathematical development on society at large. An oft cited case is Euler's theorem in number theory

$$a^{\varphi(n)} = 1 \ (\text{mod } n)$$

and its subsequent use in cryptosystems to secure privacy.

For millennia, mathematicians have contributed their talents to military goals and missions. Legend has it that Archimedes put his scientific knowledge to military use. Galileo developed the "military compass" that proved useful in ballistics. Von Neumann was said to be a "hawk" with respect to atom bombs. Wiener developed extrapolation methods that feed into guided missile theory (and later became a "dove"). Some theoretical mathematicians, though abstaining personally from "real-world" problems, justify their applications for grants and contracts by asserting potential, as yet undeveloped applications.

There are now quite a few university courses in computer ethics, and Stamatellos's slim volume can be used productively in them. An appendix that readers can use for further study and comparison contains the individual codes of ethics promulgated by the Association for Computing Machinery, the IEEE, the Data Processing Management Association, and the Institute for Certification of Computing Professionals. The book also serves to stir up deep and disturbing thoughts about the basic paradox and dilemma posed by our secular religion known as progress.

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