



## Computer ethics: Its birth and its future

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**Abstract.** This article discusses some “historical milestones” in computer ethics, as well as two alternative visions of the future of computer ethics. Topics include the impressive foundation for computer ethics laid down by Norbert Wiener in the 1940s and early 1950s; the pioneering efforts of Donn Parker, Joseph Weizenbaum and Walter Maner in the 1970s; Krystyna Gorniak’s hypothesis that computer ethics will evolve into “global ethics”; and Deborah Johnson’s speculation that computer ethics may someday “disappear”.

**Key words:** applied ethics, computer ethics, cybernetics, global ethics, information ethics, professional responsibility

### Introduction

The present article was part of a panel on “the current state and future prospects of computer ethics as a field of philosophical study”.<sup>1</sup> My role on the panel was to sketch some highlights of the history of computer ethics, and then discuss the future of the field.

### Historical milestones

Computer ethics as a field of scholarly research was created by MIT professor Norbert Wiener during World War II. In the early 1940s, he helped to develop an antiaircraft cannon that was capable of shooting down fast war planes. Wiener and some of his colleagues responded to the engineering challenge of this project by creating a new scientific field – the science of information feedback systems – which Wiener named ‘cybernetics’. With remarkable insight, Wiener combined the concepts of cybernetics with ideas from digital computing, and he foresaw a number of today’s computer ethics issues. In 1948, in his book *Cybernetics: Or Control and Communication in the Animal and the Machine*, Wiener said the following:

It has long been clear to me that the modern ultra-rapid computing machine was in principle an ideal central nervous system to an apparatus for automatic control; and that its input and output need not be in the form of numbers or diagrams. It might very well be, respectively, the readings of artificial

sense organs, such as photoelectric cells or thermometers, and the performance of motors or solenoids . . . we are already in a position to construct artificial machines of almost any degree of elaborateness of performance. Long before Nagasaki and the public awareness of the atomic bomb, it had occurred to me that we were here in the presence of another social potentiality of unheard-of importance for good and for evil.<sup>2</sup>

In 1950 Wiener published his trailblazing book, *The Human Use of Human Beings*.<sup>3</sup> Although he did not use the term ‘computer ethics’ (which came into common use more than two decades later), he laid down a comprehensive foundation for computer ethics research and analysis. Wiener’s book included, for example,

1. An account of the purpose of a human life
2. Four principles of justice
3. A powerful method for doing applied ethics
4. Discussions of the fundamental questions of computer ethics
5. Examples of key computer ethics topics<sup>4</sup>

Wiener’s foundation of computer ethics was far ahead of its time. As a result, though, other scholars essentially ignored it for decades. On his view, the integra-

<sup>2</sup> Norbert Wiener. *Cybernetics: Or ntrrol and Communication in the Animal and the Machine*. Technology Press, Boston, MA, pp. 27–28, 1948.

<sup>3</sup> Norbert Wiener. *The Human Use of Human Beings: Cybernetics and Society* Houghton Mifflin, Boston, 1950. (2nd edn. Revised, Doubleday Anchor, New York, 1954. This edition is significantly revised and enriched.)

<sup>4</sup> For details, see Terrell Ward Bynum. The Foundation of Computer Ethics. *Computers and Society*, 30(2), June 2000.

<sup>1</sup> The panel was part of the CAP2000 Conference (Computers and Philosophy 2000) held in August 2000 at Carnegie Mellon University and sponsored by the American Philosophical Association.

tion of computer technology into society will require the remaking of society – a “second industrial revolution” – a multi-faceted process taking decades to achieve. Such a vast undertaking will include a wide diversity of tasks and challenges: Workers will have to adjust to radical changes in the work place; governments will need new laws and regulations; industry and business will have to create new policies and practices; professional organizations will require new codes of conduct for their members; sociologists and psychologists will have to study and analyze new social and psychological phenomena; and philosophers will need to rethink and redefine old social and ethical concepts.

In the mid 1960s, computer scientist Donn Parker began to examine unethical and illegal uses of computers by computer professionals. “It seemed,” Parker said, “that when people entered the computer center, they left their ethics at the door”.<sup>5</sup> Parker collected examples of computer crime and other unethical computerized activities. In 1968 he published “Rules of Ethics in Information Processing”<sup>6</sup> and he headed the development of the first Code of Professional Conduct of the Association for Computing Machinery (eventually adopted by the ACM in 1973). During the next two decades, Parker produced books, articles, speeches and workshops that re-launched the field of computer ethics, giving it new momentum and importance. Although Parker’s work was not informed by a general theoretical framework, it was the next important milestone in the history of computer ethics after Wiener.

During the late 1960s, Joseph Weizenbaum created a computer program that he called ‘ELIZA’. As an experiment, Weizenbaum used ELIZA to provide “a crude imitation of a Rogerian psychotherapist engaged in an initial interview with a patient”. Weizenbaum was shocked by the reactions that people had. Computer scholars at MIT, who knew how his simple program worked, nevertheless became emotionally involved with the computer, sharing intimate thoughts with it. Some practicing psychiatrists saw ELIZA as evidence that computers soon would be performing automated psychotherapy. Weizenbaum was concerned that an “information processing model” of human beings was reinforcing an already growing tendency among scientists, and even among the general public, to see humans as mere machines. In response, Weizenbaum wrote the

<sup>5</sup> See John L. Fodor and Terrell Ward Bynum, creators. *What Is Computer Ethics?* [a video program]. Educational Media Resources, Kingston, New York, 1992.

<sup>6</sup> Donn Parker. Rules of Ethics in Information Processing. *Communications of the ACM*, 11: 198–201, 1968.

book *Computer Power and Human Reason*,<sup>7</sup> which forcefully expressed his ethical concerns. The book, together with his courses at MIT and the many speeches he gave in the 1970s, inspired a number of thinkers and projects in computer ethics.

In the mid 1970s, while teaching a university course in medical ethics, Walter Maner noticed that when computers become involved in medical ethics cases they tend to add important new ethical features to the case. As a result Maner began to use the term ‘computer ethics’ to refer to “ethical problems aggravated, transformed or created by computer technology”.<sup>8</sup> He envisioned a field of applied ethics similar to medical ethics or business ethics. (He did not know then that Norbert Wiener, more than two decades before, had laid down a foundation for such a field of research.) Maner developed a university computer ethics course and offered a variety of workshops and lectures at conferences across America. He suggested course descriptions for university catalogs, a rationale for offering such courses, and a list of course objectives. His lectures and workshops highlighted questions about privacy and confidentiality, computer crime, computer decision making, technological dependence, and codes of ethics for computer professionals. These trailblazing efforts spurred the study of computer ethics at a number of colleges and universities in the United States.

By the late 1970s, Parker, Weizenbaum and Maner had raised the computer ethics consciousness of a number of American scholars. In addition, several computing-related social and ethical problems had become public issues in America and Europe: computer-enabled crime, disasters from computer failures, invasions of privacy via computer databases, and major law suits regarding software ownership. The time was right for exponential growth in computer ethics.

In 1979, in a response to Weizenbaum’s book *Computer Power and Human Reason*, James Moor published his pioneering article, “Are there decisions computers should never make?”<sup>9</sup> By 1985, Moor’s prize-winning article, “What is computer ethics?”, had appeared in a special computer-ethics issue of the

<sup>7</sup> Joseph Weizenbaum. *Computer Power and Human Reason: From Judgment to Calculation*. Freeman, San Francisco, 1976.

<sup>8</sup> See Walter Maner. *Starter Kit in Computer Ethics*. Helvetia Press and the National Information and Resource Center for Teaching Philosophy, Hyde Park, New York, 1980. [Originally self-published by Maner in 1978.]

<sup>9</sup> James H. Moor, Are there Decisions Computers Should Never Make?, *Nature and system*, 1: 217–229, 1979.

journal *Metaphilosophy*.<sup>10</sup> In that same year, Deborah Johnson published her influential textbook *Computer Ethics*, which set the research agenda of the field for over a decade.<sup>11</sup> In 1987 the first computer ethics research center was created.<sup>12</sup>

Explosive growth of computer ethics occurred in the 1990s. New university courses, research centers, conferences, journals, articles and textbooks appeared, and a wide diversity of additional scholars and topics became involved. For example, thinkers like Donald Gotterbarn, Keith Miller, Simon Rogerson, and Dianne Martin – as well as organizations like Computer Professionals for Social Responsibility, the Electronic Frontier Foundation, and ACM-SIGCAS – spearheaded projects relevant to computing and professional responsibility. In 1995, the ETHICOMP series of conferences began at De Montfort University in the UK; and in 1997, the CEPE conference series was launched in the Netherlands at Erasmus University. By 1999, the computer ethics journal *Ethics and Information Technology* began publication; and in summer 2000, an international computer ethics organization (INSEIT<sup>13</sup>) was launched at CEPE2000 in Dartmouth College.

### The future of computer ethics

Given the explosive growth of computer ethics during the past two decades, the field appears to have a very robust and significant future. Two important thinkers, however, Krystyna Gorniak-Kocikowska and Deborah Johnson, have recently argued that computer ethics will disappear as a separate branch of applied ethics.

*The Gorniak Hypothesis.* In 1996, Gorniak-Kocikowska predicted, in her article “The computer revolution and the problem of global ethics”<sup>14</sup> that

<sup>10</sup> James H. Moor, What Is Computer Ethics?. In Terrell Ward Bynum, editor, *Computers and Ethics*. Blackwell, Oxford, UK. [The October 1985 issue of the journal *Metaphilosophy*, 16(4).]

<sup>11</sup> Deborah G. Johnson. *Computer Ethics*. Prentice-Hall, Englewood Cliffs, New Jersey, 1985. In the same year, Johnson, together with John W. Snapper, co-edited a book of readings: *Ethical Issues in the Use of Computers*. Wadsworth, Belmont, California, 1985.

<sup>12</sup> The Research Center on Computing and Society at Southern Connecticut State University.

<sup>13</sup> See Herman Tavani’s article above for information about INSEIT.

<sup>14</sup> Krystyna Gorniak-Kocikowska. The Computer Revolution and the Problem of Global Ethics. In Terrell Ward Bynum and Simon Rogerson, editors, *Global Information Ethics*, pp. 177–190. Opragen, Guildford, UK, 1996. (the April 1996 issue of *Science and Engineering Ethics*).

computer ethics eventually will evolve into global ethics:

Just as the major ethical theories of Bentham and Kant were developed in response to the printing press revolution, so a new ethical theory is likely to emerge from computer ethics in response to the computer revolution. The newly emerging field of information ethics, therefore, is much more important than even its founders and advocates believe. (p. 177)

The very nature of the Computer Revolution indicates that the ethic of the future will have a global character. It will be global in a spatial sense, since it will encompass the entire Globe. It will also be global in the sense that it will address the totality of human actions and relations. (p. 179)

Computers do not know borders. Computer networks . . . have a truly global character. Hence, when we are talking about computer ethics, we are talking about the emerging global ethic. (p. 186)

. . . the rules of computer ethics, no matter how well thought through, will be ineffective unless respected by the vast majority of or maybe even all computer users. This means that in the future, the rules of computer ethics should be respected by the majority (or all) of the human inhabitants of the Earth. . . In other words, computer ethics will become universal, it will be a global ethic. (p. 187)

According to Gorniak’s hypothesis, ‘local’ ethical theories – like Europe’s Benthamite and Kantian systems and the ethical systems of other cultures in Asia, Africa, the Pacific Islands – will eventually be superceded by a global ethics evolving from today’s computer ethics. ‘Computer’ ethics, then, will become the ‘ordinary’ ethics of the information age.

*The Johnson Hypothesis.* In her 1999 ETHICOMP keynote address,<sup>15</sup> Deborah Johnson expressed a view which, upon first sight, may seem to be the same as Gorniak’s. A closer look at the Johnson hypothesis reveals that it is a different kind of claim than Gorniak’s, though not inconsistent with it. Johnson’s hypothesis addresses the question of whether or not the name ‘computer ethics’ (or perhaps ‘information ethics’) will continue to be used by ethicists and others to refer to ethical questions and problems associated with information technology. On Johnson’s view, as

<sup>15</sup> Deborah G. Johnson. *Computer Ethics in the 21st Century*. Keynote address delivered at the 4th ETHICOMP International Conference on the Social and Ethical Impacts of Information and Communications Technologies. Luiss Guido Carli University, Rome, Italy, October 6–8, 1999.

information technology becomes very commonplace – as it gets integrated and absorbed into our everyday surroundings and is perceived simply as an aspect of ordinary life – we may no longer notice its presence. At that point, we would no longer need a term like ‘computer ethics’ to single out a subset of ethical issues arising from the use of information technology. Computer technology would be absorbed into the fabric of life, and computer ethics would thus be effectively absorbed into ordinary ethics.

Taken together, the Gorniak and Johnson Hypotheses look to a future in which what we call ‘computer ethics’ today is globally important and a vital aspect of everyday life, but the name ‘computer ethics’ or ‘information ethics’ may no longer be used.

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