

A COMPARISON OF RECENT TEXTBOOKS FOR TEACHING COMPUTER ETHICS TO UNDERGRADUATES

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ABSTRACT

This paper responds to the continuing interest in the teaching and learning about computer ethics both by college undergraduates and for practicing professionals. The most recent (1990 or later) proposed or potential textbooks the author is familiar with are reviewed according to an independent set of topics the author has created from a variety of sources. This selection of topics is based the author's 17 years of classroom experience teaching computer ethics with some of these textbooks, the contents of the textbooks reviewed, and other sources. The author does make final evaluations of those texts he would choose to use for several course formats based on length and depth desired, plus student focus, maturity, and interest. Because of the author's teaching experience and orientation, the target courses would tend to those taught in small and/or liberal arts colleges. However, the materials reviewed are all practical for work in large university settings as well. An annotated appendix, available from the author upon request, provides summary comparisons of what are admittedly the author's personal views on the topics of importance and their coverage in these books. Some references to an earlier comparative study, now somewhat dated, are made. However, the author attempts to be more specific in his qualitative analysis and the pedagogical value of these texts. Although other studies are cited, the views expressed are strictly those of the author.

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INTRODUCTION

"The great Russian writer, Aleksandr Solzhenitsyn, says the line between good and evil is drawn not between principalities and powers but through every human heart. If people believe all that matters is what feels right, they have no means to disarm the evil within them and to do good."
Quoted in [COL95]

In recent years there has been a recurring focus on topics related to the teaching and wrestling with computer ethics issues having personal, professional, and social overtones as part of the computer science curriculum. [GIB86], [ROT81]

In conjunction with this new emphasis at every level from the National Science Foundation (NSF) to accrediting agencies to local computer science publications and conferences, there have been several new and revised textbooks published which can be used as primary or supplementary texts as well as for reference purposes. In addition, the most recent comparative review is dated [BER91] and a number of new and revised books have recently become available.

This writer has used many of them at some time in his course on computer ethics or as support in other courses he has taught.

The assumption in this paper is that such books could be used for classes of from 1 to 4 hours semester credit, for adult education courses, as secondary texts in courses on topics like software engineering or database concepts, among others, or for self-study by students or practicing professionals. Also, it is possible for these texts to be used in courses for students in other majors as long as some programming or understanding of what

computer-based careers and responsibilities are all about. Courses in the social sciences or continuing and professional engineering ethics might be other situations where these textbooks would be applicable. However, because of the author's interest in and, hopefully, understanding about liberal arts and other small college computer science curriculum, the presentation will focus somewhat on these areas.

GOALS FOR THE PAPER

The goals for this paper include, first, to present criteria for computer ethics textbook reviews using his own and other's models. [BER91] Second, the paper attempts to show teaching methods and strategies, plus baseline assessments of the most recent, well-recognized textbooks with which the author has familiarity. Third, the author wishes to suggest areas where all books or some are weak and where future authors may wish to focus some of their efforts. Finally, the author introduces briefly methodological approaches and considerations in using the texts.

ASSUMPTIONS AND CRITERIA USED FOR EVALUATING TEXTBOOKS

Today almost every computer science program in the U.S. and Canada has one or more strategies for introducing the issues, case studies, and continuing dilemmas brought on by the increasing use of computers in modern society. Cases such as Union Carbide (India), the Intel Pentium chip, and Paul Zimmerman's PGP encryption case make daily news. The NSF, curriculum guides, and individual computer science departments have all attempted to address these issues with funding and summer workshops.

Institutions have provided a variety of course solutions to student awareness from carefully prescribed modules in many of the computer sciences courses required in the major to 1-4 hour courses specifically on the topic of "computer ethics" as departmental options or campus-wide activities and efforts. These courses are being emphasized in both liberal arts and engineering programs. It is safe to say there is no uniform agreement on which approach changes (or impacts) most students' behavior now and in the future, if any does. However, it is the author's firmly held belief and experience that students cannot resolve complex ethics issues until they have personalized their own

individual ethics stance and made it work—at least part of the time! See [COL95] as well.

Although the author's host department has a variety of approaches, emphases, and reinforcements for addressing personal ethics and awareness [ROT91] the author also believes in and teaches a separate course required of all majors at about the junior level (syllabus available upon request). This course has included a term paper, several position papers (borrowed from the ideas of [MIL91], evaluating and debating numerous case studies, and this fall allowed students to **write** their own scenarios for case studies. One might also require students to react and refine each other's scenarios. The rest of this paper will compare recent texts for use in a 1-4 hour course and identify those texts most useful for self-study and teacher preparation. Other assumptions in this discussion are:

1. Each student is expected to have his/her own text, attend class, and participate in all class discussions. [None of these are safe assumptions today. The author sometimes does allow needy students to show a text because of the nature of his department's one hour course.]
2. Although reasonably complete, no text is considered to have all the material any instructor would want or need— specific topics, case studies, recent incidents, dialogues and debates.
3. There will continue to be more and revised texts with even better ideas. Those discussed here are the most recent ones of which the author is aware.
4. "Older" textbooks are almost as good, but because of student attitudes toward such texts, only the most recent and up-to-date are reviewed. [Recently, student attitudes seem to favor less expensive books regardless of their pedagogical value or dating!]
5. Books which contain only case studies or are primarily designed for or suited to engineering ethics courses are not reviewed here.
6. For obvious reasons, students are increasingly frustrated with expensive textbooks that are seldom used.

SUMMARY EVALUATIONS INCLUDING THOUGHTS ON PEDAGOGY

The spreadsheet comparison available from the

author represents his "three point scale" (+1, 0, -1) comparison of these books. The point totals are strictly cumulative and not weighted. However, on some topics where a book was especially strong, additional points were rewarded beyond the +1/-1. The author's view is that texts [HUF94], [JOH94] or [DUN91] are best for full 3-4 quarter or semester hour courses. Although not complete in topics stressed, Forrester [FOR94] runs a close "second" to the above, and is desirable for short courses or as a supplemental text in courses for computer science majors along with [JOH94].

ACKNOWLEDGMENTS

I wish to express thanks to many small college colleagues and friends over the years for their helpful discussions on these issues, especially Gail Miles for her insights about better pedagogy on "position papers". Also, I have learned from Keith Miller who has been very effective in my several experiences with him on "the care and feeding" of students in these courses. Further, several colleagues and peers in other departments who have lived extremely thoughtful and challenging lives before me: Mary Green, Dave Neuhouser, and Elmer Nussbaum are to be commended here. Finally, to my wife and three sons who have provided me with the ideal home laboratory for validating (and/or unlearning) my "insights" on personal ethics.

REFERENCES AND ANNOTATED BIBLIOGRAPHY

[BER91] Bergin, T. J. "Comparative Review" [of Computer Ethics Texts]. Computing Reviews, June, 1991.

This helpful, but dated four page review highlights Dejourie, et.al.[DEJ91], Ermann, et.al. [ERM91], Forrester (1st ed., see [FOR94]), the two earlier Deborah Johnson books (see [JOH94]), and Donn Parker's, et.al., classic case studies.[PAR88] It has good summaries of each of the books mentioned and served as an inspiration for this paper.

[BON55] Bonhoeffer, Dietrick. Ethics, ed. by Eberhard Bethge. Macmillan, 1955.

Written by one of the few churchman who took a stand during the Nazi Period in Germany. Although heavy reading and not yet used in my classes, I think this book could be used as an effective foundation in computer ethics classes. Bonhoeffer's involvement in

the plot to kill Adolf Hitler makes for an intriguing teaching twist in this martyr's life and great classroom material.

[CLO81] Clouse, Robert G., ed. War: Four Christian Views. InterVarsity Press, 1981.

Not a textbook, but a good auxiliary text or reference book for those students concerned with their work efforts and related issues of pacifism and justice. Students have found it a very helpful reference when writing position papers related to this topic. It shows four very diverse positions held by individuals with similar religious beliefs and backgrounds.

[COL95] Colson, Charles. "It Feels Right to Me". Breakpoint, Prison Fellowship, March, 1995, p. 17.

This article by Charles Colson is from a series of talks he recently gave at Harvard University on personal ethics which was to be entitled "Why Good People Do Bad Things". Colson preferred to call them "Why Bad People Do Good Things". Included is this Aleksandr Solzhenitsyn' statement quoted by Colson and given in the introduction to this paper. A colleague and the author used this issue of Breakpoint, titled "The Dilemma in Personal Ethics", as part of their 1995 courses.

[DEJ91] Dejourie, Roy, George Fowler, and David Paradise. Ethical Issues in Information Systems. Boyd and Fraser, 1991.

Designed primarily for a CIS or business curriculum, it does have areas of strength on topics such as accuracy, business implications, and privacy. With essays written by outstanding authors such as J. Daniel Cougar, Arthur R. Miller, Karen Nussbaum, and discussions taken from the CPSR Newsletter. It contains some fascinating material in its 300 pages and could be used for a one hour course or supplemental text at any level.

[DUN91] Dunlop, Charles, and Rob Kling, Eds. Computerization and Controversy: Value Conflicts and Social Choices. Academic Press, 1991.

Another text with a provocative subtitle, this large (758 pages) book has much to offer with good essays, clear controversies, and great E-mail dialogues. It has some intense value conflicts (gender deception on the Internet) and the demerits of the SDI by David Parnas, plus some gentler talks by people such as John Scully. The author has enjoyed using it as a text, but it is too much for a

one hour course.

[ERM90] Ermann, M. David, Mary B. Williams, and Claudio Gutierrez, eds. Computers, Ethics, and Society. Oxford University Press, Inc., 1990.

One of my favorite texts, but one only the most mature undergraduates seem to appreciate. It has three great chapters introducing foundational philosophy, and has some of the best "classical" essays by Aristotle, Saint Augustine, Joseph Weizenbaum, Richard M. Stallman, and Sherry Turkle, all of who should be quoted more frequently. Probably best suited for mature classes, graduate students, or personal professional development.

[FOR94] Forrester, Tom and Perry Morrison. Computer Ethics: Cautionary Tales and Ethical Dilemmas in Computing, 2nd. ed. MIT Press, 1994. This concise book (347 pages) is recommended for a short course for professionals and/or a 2-3 hour undergraduate course. It moves quickly and uses recent newspaper articles (both a strength and a weakness) to focus on the major topics. Too short to address every issue, it hits the major ones and includes 30 pages of "Hypothetical Scenarios for Classroom Use". The appendix on the 1991 ACM/IEEE-CS Joint Curriculum is unnecessary, if not inappropriate.

[GIB86] Gibbs, Norman and Allen Tucker. "Model Curriculum for a Liberal Arts Degree in Computer Science". CACM, March, 1986.

[HUF94] Huff, Chuck and Thomas Finkel, eds. Social Issues in Computing: Putting Computing in Its Place. McGraw-Hill, Inc., 1994

A very creative book that does justice to its subtitle. The book contains a collection of careful articles, and has the strongest sections of any book reviewed on computer education, power and human rights. Good reading, discussion, and project questions are included in each chapter.

[JOH95] Johnson, Deborah G. and Helen Nissenbaum. Computers, Ethics, and Social Values. Prentice-Hall, 1995.

The most recent anthology in this group from one of the leading experts on the topic. It did not outperform the others to the degree the author had expected, but it is still one of the best contenders for a full 3-4 hour course for computer science majors with a primary focus on a variety of independent topics.

(714 pages)

[JOH94] Johnson, Deborah G. Computer Ethics, second edition, Prentice-Hall, 1994.

A long-awaited textbook from one of the most gifted and respected writers in the field. This small book (181 pages) is ideal for a short course or as a supplemental textbook. Her case studies are excellent and extremely well thought out. The author can recommend it highly from his experience with the book.

[MIL93] Comments made by Gail Miles during her panel presentation at this conference regarding the merits of several short position papers rather than a term paper has helped the author refocus the writing portion of his course. SESCCC Proceedings, (Nashville, Tenn.), Fall, 1991.

[OZ94] Oz, Effy. Ethics for the Computing Age. William C. Brown Communication, Inc., 1994. This very readable book contains more information than most of the others on legal issues at a sacrifice of some of the other topics such as health issues and whistleblowing. Still, a fine text, especially for a two year or junior college setting.

[PAR88] Parker, Donn B., Susan Swope, and Bruce N. Parker. Ethical Conflicts: in information and computer science, technology, and business. Q.E.D. Information Sciences, 1988.

[PER87] Perrolle, Judith A. Computers and Social Change: Information, Property, and Power. Wadsworth, 1987.

The author did not choose to review this book in depth because of its age and heavy emphasis on the societal impact of computers, while covering less thoroughly topics of greater interest to computer science majors. Nevertheless, it is a very promising book for campus-wide or cross-discipline courses.

[ROS92] Rosenberg, Richard S. The Social Impact of Computers. Academic Press, 1992.

One of the easiest to read of these books, it contains standard sections on application areas such as medicine, law, education, government, and others. Probably better for broad audiences than computer science majors, although the preface indicates it is aimed at the latter.

[ROT91] Roth, R. Waldo. "The Impact of the New ACM/IEEE-CS Curriculum Recommendations for the Small Liberal Arts College: A Case Study". SESCCC Proceedings, (Nashville, Tenn.), Fall, 1991.

[ROT81] Roth, R. Waldo. "An Experimental Undergraduate Course in Computer Law and Ethics". ACM SIGCSE Bulletin, Feb., 1981.

[SEL94] Sellers, Don., ed. by Stephen F. Roth. ZAP! Peachpit Press, 1994.

This information filled, 157 page book is the current definitive reference on health issues and research related to computers and their use. Its inexpensive cost, \$12.50 (or \$9.95 for ACM members) and its relevance to students has made it the most popular and best-selling book I have encouraged students to buy in recent years.