A Model for Incorporating Ethics Instruction into the OEIS Curriculum

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This article proposes a framework for incorporating ethics instruction into the OEIS Model Curriculum by drawing upon some relevant analogies involving instruction and research in the field of computer ethics. The first consideration is a relatively recent strategy used to infuse instructional material on ethics into a joint curriculum project sponsored by the two major professional computer associations: the Association for Computing Machinery (ACM) and the Institute for Electrical and Electronics Engineering—Computer Society (IEEE-CS). I then examine some ways in which key aspects of a recently proposed computer-ethics research model can inform the design and development of instructional units on ethics in the Organizational and End-user Information Systems (OEIS) Model Curriculum. Additionally, this article includes a description of how ethics instruction can be implemented either as a stand-alone, dedicated ethics course or as a cluster of course modules in existing courses, or both. Finally, the question, "Who should teach the ethics courses or course modules?," is addressed. This article concludes by advocating for an interdisciplinary instructional model that incorporates the expertise of instructors and practitioners in three different fields: OEIS/IT, philosophy/ethics, and the social sciences.

Courses in computer and information ethics have been taught at colleges and universities in the U.S. for more than 25 years, and the number of ethics-related courses and course modules available to computing and IT professionals has increased significantly in the past decade. This article examines some strategies for extending relevant features of ethics instruction currently implemented in the Computer Science (CS) Curriculum to the OEIS Model Curriculum. I also describe how a research model for computer ethics, proposed by Brey (2004), can aid educators in constructing a plausible framework for ethics instruction in the OEIS Model Curriculum.

The Challenge of Infusing Ethics Instruction into the OEIS Model Curriculum

The OEIS Model Curriculum was developed with the endorsement of the Organizational Systems Research Association (OSRA). The OEIS Model Curriculum (henceforth referred to as OEIS-MC) consists of 13 units or modules, which together constitute a set of curriculum guidelines for instruction that is distributed over a four-year period. A specific objective of this curriculum aims at preparing "students with a foundation in information management and end-user information systems including software acquisition, installation, training, and end-user support for multiple occupations in an information intensive, technological workplace" (OSRA, 2004, p. 1).

The 13 modules that comprise the OEIS-MC are included within semester-long courses:

OEIS 1	Organizational and End-user Information Systems
OEIS 2	Computer User Support
OEIS 3	Assessment, Design, Implementation, and Evaluation
OEIS 4	Technical Training & Delivery Methods
OEIS 5	Telecommunications & Networking Foundations
OEIS 6	Cases in Information Technology
OEIS 7	Internship
OEIS 8	eBusiness and Web Technologies

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OEIS 9 Collaborative Technologies & Knowledge Management
OEIS 10 Network Administration
OEIS 11 Operating Systems
OEIS 12 Information Systems Security
OEIS 13 Special Topics

Seven core courses (OEIS 1-7) include competencies that are considered vital. Courses included within OEIS 8-13, on the other hand, are optional and can be incorporated into the curriculum depending upon an OEIS program's needs. (See http://www.osra.org/curriculum2004.pdf for a more detailed description of the OEIS-MC.)

Although no specific units or modules on ethics instruction per se are included in the OEIS-MC, explicit mention of "ethical considerations" is made in the list of identified "additional skills." The OEIS-MC also suggests that these additional skills be "developed and practiced across the curriculum." How, exactly, can ethics instruction be incorporated into this curriculum for OEIS students? One option would be to include a 14th unit dedicated to ethical and social issues; another would be to infuse ethics instruction across the 13 existing modules. A strong case can be made for either approach and, perhaps, a stronger one could be advanced for doing both. To see how both techniques have been implemented in the computer science curriculum, we can briefly examine the recent model jointly adopted by the two major computer associations: the Institute for Electrical and Electronics Engineering—Computer Society (IEEE-CS) and the Association for Computing Machinery (ACM).

Ethics Instruction in the Computing Curriculum

The IEEE-CS/ACM Joint Task Force on Computing Curricula issued a final report in December 2001, titled "Computing Curricula 2001: Computer Science" (henceforth referred to as CC2001), mandating the inclusion of 16 core hours of instruction on topics that are *social*, *ethical*, and *professional* in the curriculum for undergraduate computer science students. These topics, each prefaced with an *SP* designation, define one knowledge area or body of knowledge. They are distributed among the following 10 units (IEEE Computer Society Press, 2002, pp. 152-157):

SP1: History of computing
SP2: Social context of computing
SP3: Methods and tools of analysis
SP4: Professional and ethical responsibilities
SP5: Risks and liabilities of safety-critical systems
SP6: Intellectual property
SP7: Privacy and civil liberties
SP8: Computer crime
SP9: Economic issues in computing
SP10: Philosophical frameworks of ethics

CC2001 further recommends that the 10 SP units be covered through a combination of one required ethics/social issues course along with short ethics modules in other courses. Because it would be difficult to cover topics pertaining to SP2, SP3, SP4, and SP10 in the context of traditional computer science courses, a stand-alone or dedicated ethics course was recommended. It was also suggested that other topics, such as those included in SP1, SP5, SP7, SP8, and SP9, could be covered in varying degrees as modules in standard computer science courses.

Of particular interest to ethics instruction per se are units SP3 and SP10. According to SP3, undergraduate students should receive instruction on how to: (a) make and evaluate ethical arguments, and (b) identify and evaluate ethical choices ("Computing Curricula 2001," 2002, p. 154). Among the topics recommended for inclusion in SP10 are instruction on philosophical frameworks that include deontological and utilitarian theories. (While deontological moral theories focus on the importance of duty/obligation as the appropriate criteria for evaluating individual actions and social policies with respect to ethics, utilitarian moral theories evaluate actions and policies via criteria involving the promotion of the greatest good for the greatest number of persons.) As part of the learning objectives for this unit, students are expected to be able to recognize the distinction between

ethical theory and professional ethics and to be able to summarize the basic concepts of utilitarian and deontological theories ("Computing Curricula 2001," p. 157).

The question, "Who should teach ethics courses and course modules to CS and IT students?," has been and continues to be debated in the computer ethics literature. The main concern in this article, of course, is with the question, "Who should teach ethics courses to OEIS students?" To answer this question, it would be helpful to see how some computing/IT professionals and philosophers have worked together to implement instructional units for ethics in the CS Curriculum. First, however, it would be useful to understand some of the standard methodological frameworks that have been proposed and adopted for computer ethics research.

Computer Ethics as a Branch of Applied Ethics: Three Distinct Perspectives

Computer ethics, as a field of study, is a branch of *applied ethics*. Applied ethics, as opposed to theoretical ethics, examines practical ethical issues. It does so by analyzing those issues from the vantage-point of one or more ethical theories. Whereas ethical theory is concerned with establishing logically coherent and consistent criteria in the form of standards and rules for evaluating moral problems, the principal aim of applied ethics is to analyze specific moral problems themselves through the application of ethical theory. Understanding computer ethics as a field of applied ethics that examines moral issues pertaining to computing and information technologies is an important first step. However, much more needs to be said about the perspectives that interdisciplinary researchers bring to their analysis of the issues that make up this relatively new field. Research in the field of applied ethics has generally proceeded from one of three different perspectives: (1) professional ethics, (2) philosophical ethics, and (3) descriptive ethics (Tavani, 2004).

Perspective #1: Computer Ethics as a Field of Professional Ethics

From the vantage-point of *professional ethics*, the field is concerned with identifying and analyzing issues of ethical responsibility for computer professionals. Among the computer ethics issues considered from this perspective are those having to do with a computer professional's role in designing, developing, maintaining, and supporting computer hardware and software systems. For example, OEIS professionals who support end-user computer systems might discover aspects of those systems that invade users' privacy or that contain faulty/unreliable code (e.g., software bugs). In this case, the OEIS professional may be confronted with a decision of whether or not to "blow the whistle."

Gotterbarn (1995), who advocates for the view that computer ethics is best understood as a field of professional ethics, has argued that the principal focus of computer ethics should be on issues of professional responsibility and not on the broader moral and social implications of that technology. However, critics, such as Buchanan (2004), argue that Gotterbarn's conception of computer ethics simply as a field of professional ethics is too narrow. In fact, many computer/information professionals currently working in the field of computer ethics believe that a broader model is needed. For example, Buchanan, who (like Gotterbarn) recognizes the important role that the analysis of ethical issues involving the information professions serves, suggests that the study of computer/information ethics issues must also include an examination of certain non-professional ethics issues (compare Tavani, 2004).

Perspective #2: Computer Ethics as a Field of Philosophical Ethics

Since philosophical methods and tools are used to analyze issues involving professional ethics, one might initially assume that any attempt to distinguish between professional ethics and philosophical ethics is a bit odd. However, a

useful distinction can be drawn between the two perspectives because of the approach each takes in understanding and analyzing ethical issues. While professional ethics issues typically involve concerns of responsibility and obligation affecting individuals as members of a certain profession, philosophical ethics issues include broader concerns that affect social policies as well as individual behavior (Tavani, 2004). Therefore, unlike professional ethics issues, which are typically limited to issues that directly impact people working in a particular profession, issues examined from the perspective of philosophical ethics tend to affect virtually everyone in society.

Consider, for example, that computer-related moral issues involving privacy, security, property, and free speech can affect nearly everyone, including people who have never even used a computer. Also, consider that some recent issues affecting privacy concerns have stretched and strained many of our normative concepts and policies. For example, we have to reconsider the question, "What, exactly, is personal privacy?" We also need to ask "How, specifically, is privacy threatened and violated by computers and computer-related technologies?" Assuming that we can identify the ethical issues that arise out of the use of these technologies, we can ask whether our traditional ethical theories are sufficiently robust to handle any *new* issues that emerge or whether a brand new theory is needed for the information age. These and related issues are examined from the perspective of philosophical ethics.

Perspective #3: Computer Ethics as a Field of Descriptive Ethics

The two previous perspectives can both be understood as *normative* approaches to applied ethics issues, which are contrasted with *descriptive* inquiries and studies. While descriptive investigations provide us with information about "what *is* the case," normative inquiries evaluate situations from the vantage-point of questions having to do with "what *ought to be* the case." From the perspective of descriptive ethics, the primary emphasis is on describing or reporting the social impact of issues that have moral implications.

It is also important to distinguish between assertions or claims that are normative and those that are descriptive. Consider the following three assertions involving Bill Gates: (1) "Bill Gates served as the Chief Executive Officer of Microsoft Corporation for many years"; (2) "Bill Gates should expand Microsoft's product offerings"; and (3) "Bill Gates should not engage in business practices that are unfair to competitors." Whereas the first of these claims is descriptive, the second and third are normative. A person making the first assertion (1) has made a descriptive claim about Gates, which merely reports some features or characteristics about Gates. Someone expressing either the second or third assertions, however, makes a normative claim regarding Bill Gates, because those claims contain evaluative terms such as "should" and "ought." As such, these two assertions do more than merely report something about Gates in purely descriptive terms. It is important to note that not every normative claim is also a moral claim. For example, the normative assertions expressed in (2) and (3) are different in at least one very significant respect. Even though both assertions are normative, only (3) is also a moral assertion.

Some sociologists and social scientists working in the field of computer ethics, such as Huff and Finholt (1994) and Kling (1996), believe that focusing initially on descriptive aspects of ethical issues can help us to better understand their normative features and implications. For example, Huff and Finholt have argued that when we understand the social effects of technology in its descriptive sense, the normative ethical questions become clearer. An analysis of the social impact of computer technology in descriptive terms can also help us to be better informed in two important respects. First, approaching questions from the descriptive perspective can better prepare us for our subsequent analysis of certain practical ethical issues affecting our system of policies and laws. Second, the descriptive approach can help better prepare computer professionals in their attempts to design computer systems that might avoid

certain social and ethical problems associated with earlier computer systems. In using Huff and Finholt's model, therefore, we can see how the descriptive ethics perspective can work in conjunction with the goals and objectives of philosophical ethics and professional ethics, which are both normative in character.

Table 1 summarizes some key characteristics that differentiate the three main perspectives for approaching computer ethics issues.

A Comprehensive Computer-Ethics Methodology: The Brey Model

The three different perspectives of computer ethics described in the preceding section might suggest the need for three different kinds of methodologies. Building on a research model advanced by Brey (2004), however, it is possible to construct a single, comprehensive methodology. Brey's model is both interdisciplinary and multilevel. It is interdisciplinary because it requires the collaboration of computing/IT professionals, philosophers, and social scientists. It is multilevel because the method for conducting computer ethics research requires three levels of analysis: a *disclosure* level, a *theoretical* level, and an *application* level.

At the disclosure level, embedded moral values in the design, as well as in the various applications of computer systems, need to be identified and disclosed. At this level, the technical expertise provided by computer/IT professionals is critical, because this group of experts understands the details and nuances of computer technology in ways that philosophers and social scientists generally do not. Research at the disclosure level also often requires input from social scientists, human factors experts, and end-user professionals, who can evaluate aspects of system design from the perspective of human-interface requirements and expectations. After the embedded moral values have been disclosed, philosophers analyze the situation to determine whether the newly-disclosed moral issues can be analyzed via existing ethical theories or whether additional theoretical analysis will be required. At the theoretical level, philosophers are capable of carrying out much of the required research. Finally, at the applications level, cooperation is needed among computer/IT professionals (including OEIS professionals), philosophers, and social scientists to complete the methodological process by applying ethical theory in deliberations about particular moral issues under consideration.

Table 2 describes the academic disciplines and the corresponding tasks and functions involved in Brey's model.

Extending the Brey Model to Ethics Instruction in the OEIS Curriculum

Brey's research model can be extended to discussions involving ethics instruction within the context of the ACM and IEEE-CS Curricula, including the implementation of the 10 SP units in CC2001 (Tavani, 2001, 2002). It also can be extended to discussions involving ethics instruction in the OEIS-MC. First, consider how Brey's model can be applied to the implementation of objectives concerning ethics instruction in CC2001. We have already seen that Brey's model illustrates the crucial role that computer scientists play in disclosing embedded values in computer systems, both in the design and application of those systems. Deciphering embedded values

Table 1. Computer Ethics Perspectives

Type of Perspective	Associated Disciplines	Issues Examined
Professional	Computer Science/IT/ OEIS Engineering Library/Information Science	Professional Responsibility System Reliability/Safety Codes of Conduct
Philosophical	Philosophy Law	Privacy & Anonymity Intellectual Property Free Speech
Descriptive	Sociology Behavioral Sciences	Impact of cyber-technology on governmental/financial/educational institutions and socio-demographic groups

Table 2. The Brey Model for Computer Ethics Research

Level	Disciplines Involved	Task/Function
Disclosure	Computer Science/IT/OEIS Social Science (optional)	Disclose features involving computer technology that have moral implications
Theoretical	Philosophy	Test newly disclosed features against standard ethical theories
Application	Computer Science/IT/OEIS Philosophy Social Science	Apply standard or newly revised/formulated ethical theories to the issues

pertaining to intellectual property, crime, and privacy can help to inform instructional modules related to SP6, SP7, and SP8, respectively (see above). Without the significant contributions on the part of computer scientists at this level, philosophers and social scientists would not be able to teach computer science students about some potentially important ethical issues that could affect them as professionals.

Although philosophers teaching computer ethics courses may well realize that privacy issues define a core area of concern in the computing curriculum (i.e., in CC2001), they may be unaware that controversies involving the use of Internet cookies, as well as controversies involving data-mining practices, can have implications for privacy. Therefore, these philosophers depend on computer/IT professionals to disclose morally relevant features of technologies, especially newer technologies, that might not initially appear to have ethical implications. Once these features have been disclosed, philosophy instructors can then introduce them in the ethics courses they teach. More importantly, however, philosophers can test these particular issues against existing moral theories and principles. In some cases, philosophers may be required to modify and refine ethical theories in light of these new technological issues. Philosophy instructors can then provide computer scientists and technology professionals with revised ethical theories to frame their discussions of these ethical issues in their courses or course modules involving ethics. In this way, both philosophers and computer/IT professionals can demonstrate to students some ways in which ethical theory can be applied to real-world cases involving computing technology.

Brey explicitly discusses some issues involved in the teaching of computer ethics in a separate paper (Brey, 2001). In that paper, he argues for the need for interdisciplinary cooperation for achieving certain instructional and course objectives in the area of computer/information ethics. For example, Brey insists that an ideal computer ethics course should have "both the goal of promoting an understanding of major ethical issues in computing as well as of providing aspiring professionals with tools for giving content to their own professional responsibility in dealing with computer systems" (p. 178).

However, Brey does not provide any specific recommendations as to how these two goals should be accomplished—at least not in this paper. Instead, it is in the paper describing his computer ethics research model (Brey, 2004) that we find a more promising strategy for achieving both of the instructional goals (described in Brey, 2001). Unfortunately, Brey does not incorporate relevant aspects of his interdisciplinary computer-ethics research model (Brey, 2004) into the model used for his instructional goals (in Brey, 2001). One aim of this article is to show why it would be useful to integrate key aspects of both models advocated by Brey.

Who Should Teach Ethics Courses to OEIS Professionals?

If Brey's insights are correct, then a close working relationship is needed between philosophy and computer science/IT/OEIS instructors to develop appropriate ethics instruction for students in the computing professions. Philosopher Deborah Johnson (1994) and computer science/engineering instructors Don Gotterbarn (1994) and Dianne Martin (1994) have each argued, despite their different views on teaching computer ethics, that it is important to *sensitize*

undergraduate IT students to the various roles that they will be expected to perform as responsible professionals. Frances Grodzinsky (2001), a professor of computer science and IT, has also remarked on the important challenge that computer ethics instructors have in sensitizing students in this area. To better accomplish this task, Grodzinsky has directly called upon philosophers working in the field of computer ethics to consider a more integrative approach to ethical theory, which would incorporate aspects of virtues ethics (sometimes also referred to as "character-based ethics"). She believes that in teaching computing and IT students to be responsible professionals, character-guiding ethical theories are often more effective than action-guiding theories, such as the deontological and utilitarian theories, which tend to be included in standard ethics textbooks. By extension, Grodzinsky's point would hold for ethics instruction for OEIS students who will encounter professional dilemmas that arise in end-user information systems and applications in computing.

Philosopher James Moor (2001) has, in effect, responded to Grodzinsky's challenge by showing how virtue ethics can be integrated into a theoretical approach to computer ethics issues. Like Grodzinsky, Moor believes that virtue ethics should not be construed as a theory of ethics that is alien to deontological ethics or to consequentialist ethics, but rather can be seen as a complementary component of ethical theory that rightly stresses the importance of character traits for the practical application of ethics. Elsewhere, Moor (2004) has blended two traditional ethical theories—the deontological approach, which emphasizes duty and *justice*, and the utilitarian approach, which emphasizes *consequences*--into one unified system that he calls *just consequentialism*, which he believes better addresses particular challenges posed by computing technology.

Grodzinsky and Moor are two examples of a growing number of computer ethics instructors who realize the importance of computing/IT professionals and philosophers working together to implement the knowledge areas specified in CC2001. Once again, their arguments would hold for implementing ethics instruction within the context of the OEIS-MC as well. Both authors realize the important interplay between theoreticians and practitioners in the goal of delivering appropriate course material on ethics to undergraduate students pursuing careers in the IT profession. Grodzinsky describes the two types of contributors to this process as the "philosophical theorists" and the "philosophical engineers," or computing practitioners. She also refers to the latter group as the "practitioners from within." Grodzinsky believes that what the field of computer ethics needs is more open discourse between the two groups: those from without and practitioners from within. She believes that the reality of computer technology is such that we will all become practitioners from within on different levels.

Thus, Grodzinsky and Moor, each in different ways, give us a hint as to how the research model introduced by Brey can also be adapted to computer ethics instruction in the OEIS-MC. Each also calls for greater cooperation between the computing and philosophical communities. In issuing his call for such cooperation, Moor (2001) aptly notes that computer ethics "...requires a team effort involving people from many disciplines working together to consider what the computer technology does, what the consequences are likely to be, how it should best be conceived, and what the new policies should become" (p. 38). We could, of course, add the important consideration of ethics instruction for undergraduate OEIS students to Moor's list.

Concluding Remarks

I have argued that Brey's research model, which provides a useful plan for designing and implementing ethics instruction in CC2001, can aid us in framing a model for ethics instruction in the OEIS-MC. However, I have presented only a general framework for how this instructional model might be devised. I have not, for example, determined which kinds of ethics instruction should be implemented and whether the content should be distributed across one or more of the 13 units of OEIS-MC or should be taught in a dedicated ethics course. Assuming that the latter

strategy is preferable, I have not yet considered whether it might be included as a Special Topics course (OEIS 13) or whether a new unit (OEIS 14, for example) needs to be added. Following the model employed in CC2001, the OEIS-MC could include a stand-alone ethics course, or it could distribute ethics instruction across existing OEIS courses, or both. However, some curriculum challenges may arise in the process, and these will need to be identified and resolved before any particular strategy can be adopted. Moreover, OEIS curriculum experts will need to seriously debate the pros and cons of the strategy proposed here.

Assuming that a decision is made to infuse ethics instruction into the OEIS-MC, in a way that is both overt and explicit, several important details will need to be worked out. For example, instructors in three disciplinary areas will need to participate in developing and teaching those courses and course modules, and the participants will need to reach agreement on their respective roles in the process. A further discussion of those details at this stage, however, would take us beyond the intended scope of this article. Because of the limited objectives of this writing, I have not been able to discuss many of the important roles that faculty from each of the major areas can contribute to the instructional design and delivery of ethics courses and course modules in the OEIS-MC. In conclusion, it would seem that faculty members in each of the relevant disciplines need to come together to begin the critical discussion regarding how the essential components for a specific course or course modules needed for ethics instruction in the OEIS-MC can be developed and implemented.

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