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Ethics in Computing

A Concise Module

UTiCS

Springer

College of Science
Computer Department

Ethics in Computing

First Class
Second Lecture

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2018-2019

Ethical and Decision Making:

Both reasoning and logic are important elements in daily human interactions. Reasoning is a human cognitive process of looking for ways to generate or affirm a proposition. Cognitive processes are mental functions or activities that are grouped based on experience, interpretation, foreseeing, ordering, analyzing, valuing, and making connections. Logic on the other hand, based on the Greek meaning, is the tool for distinguishing between truth and falseness. Human beings, on a daily basis, engage in reasoning and logic to achieve the desire results from a problem or an issue. Both reasoning and logic are important in decision making. Each day we make hundreds of decisions, from what we will wear to what side of the bed to sleep on. When making these everyday decisions, many people tend to

- rely on a variety of biases and heuristics as they do their reasoning. This kind of reasoning based on intuition unfortunately leads to wrong and ethical decisions. Ethical reasoning is integrating ethical principles in the reasoning process. Each day we are faced with a variety of ethical or moral decisions, ranging from simple ones such as lying about a spouse's choice of clothing to hard ones such as contributing to an abortion campaign.

Ethical and Decision Making:

Ethical decision making is the process of making a decision that results in a least number of conflicts. Such a process requires the decision maker to do the following:
• Recognize the inherent ethical conflicts through comprehension, appreciation, and evaluation of all ethical dimensions of the problem
• Know the parties involved
• Be aware of alternatives
• Demonstrate knowledge of ethical practices
• Understand how the decision will be implemented and who will be affected
• Understand and comprehend the impact of the decision of the parties involved

A Framework for Ethical Decision Making:

Different elements make a good framework for an ethical decision. The most common elements that must be in a good framework are these:

• Recognizing inherent ethical conflicts through comprehension, appreciation, and evaluation of all ethical dimensions of problem

• Understanding the problem and the facts of the problem

• Knowing the parties involved

• Being aware of alternatives

• Demonstrating knowledge of ethical practices

• Understanding how the decision will be implemented and who will be affected

• Understanding the impact the decision will have on the parties affected

• Understanding and comprehending the impact of the decision of the parties involved

Taking these elements of the framework into consideration when making a decision lessens the number of conflicts and the severity of the impact resulting from the decision.

Codes of Ethics:

The main domains in which ethics is defined are governed by a particular and definitive regiment of rules called "codes of ethics." These rules, guidelines, canons, advisories, or whatever you want to call them, are usually followed by members of the respective domains. Depending on the domain, ethical codes can take any of the following forms:

 (i) Principles, which may act as guidelines, references, or bases for some document
(ii) Public policies, which may include aspects of acceptable behavior, norms, and practices of a society or group
(iii) Codes of conduct, which may include ethical principles
(iv) Legal instruments, which enforce good conduct through courts

Although the use of codes of ethics is still limited to professions and high-visibility institutions and businesses, there is a growing movement toward widespread use.
The wording, content, and target of many codes differ greatly. Some codes are written purposely for the public; others are targeting employees, and yet others are for professionals only. Reproduced here is the ACM Code of Professional Conduct.

Objectives of Codes of Ethics:

Different domains and groups of people formulate different codes of ethics, but they all have among them the following objectives:

1. **Disciplinary: By instilling discipline, the group or profession ensures professionalism and integrity of its members**

2. Advisory: The codes are usually a good source of tips to members and offer advice and guidance in areas where there are fuzzy moral issues.

3. **Educational: Ethical codes are good educational tools for members of the domain, especially the new ones who have to learn the do's and don'ts of the new profession. These codes are also a good source of renewal for the older members needing to refresh and polish their possibly waning morals.**

4. Inspirational: Besides being disciplinary, advisory, and educational, the codes should also carry subliminal messages to those using them to inspire them to be "good."

5. **Publicity: One way for professions to create a good clientele is to show that they have a strong code of ethics and, therefore, their members are committed to basic values and are responsible.**

Reflections on Computer Ethics
New Wine in an Old Bottle

We have so far defined computer ethics as a subset of set A in the functional definition of ethics. We next elaborate on this by pointing out some likely differences between set A in the traditional definition and set A in the functional definition, which now includes computer ethics. Although the overall picture remains the same, there are differences in the overall implementation of the models because of the changes in set A of the functional definition. These differences are manifested in several places, as discussed in the following sections.

Changing Premises

Although it is true that the outcome of the ethics value function remains the same, the domain set itself has changed and will keep changing. The number of input possibilities for every human action keeps on growing with new advances in computer technology. For example, take the act of forgery, which traditionally involves taking somebody's document, making changes to it, and getting a benefit as a result. Suppose the document is a check. Let us also assume, all other acts notwithstanding, that you have the document in your hand, in this case the check.

Traditionally, your inputs were limited to making changes to the signature and probably changing the date, and cashing it meant literally walking to the financial institution either to deposit it or asking the teller to cash it after producing identification.

Although these acts are still possible and readily accepted, new and cleverer ways have emerged as computer technology has advanced. First, now the inputs to set A of an act like this are numerous, no longer limited to the original two. They range from scanning the check to electronically reproducing almost an original check, to cashing it or depositing it without ever stepping in any financial institution, even in the late hours of the night. All these offerings were of course unheard of just a few years back, but they are giving thieves more ways to do their job and making it very difficult for financial institutions and law enforcement agents to do theirs.

Different Temptations

In traditional ethics, there were few temptations prompting unethical actions. But according to Richard Rubin, computer technology has generated many more temptations for each input action. He outlines seven of these new temptations:

1. **Speed** : The speed of gathering information has greatly increased, causing unethical actions to be carried out in shorter times, thus decreasing the chances of detection. When the chances of being caught are slim, many perpetuators think that they can get away with it.

2. **Privacy and anonymity** : The great availability of computers and computer related technology in less visible places such as people's homes; high, cheap, and fast communication equipment; and software that can guarantee anonymity are creating a highly tempting environment for unethical acts.

3. **Nature of medium** : The ability to copy digital data without erasing or altering the original in any way causes little or no suspicion and hence encourages unethical activities.

4. **Aesthetic attraction** : Technology, especially when it is new, seems to offer challenges to those who try to use it. Thus, there is a sigh of relief and a sign of great achievement if one overcomes a technological obstacle. In the same way, if an intruder tries to break into a computer system, the sign of success and the euphoria thereafter overshadows the incivility of the act itself.

Different Temptations

5. Increased availability of potential victims : With the widespread use of computers and the ever-widening reach of computer networks, an individual can now reach an unprecedented audience. This scope in itself creates an urge to attempt things that one would otherwise not have done.

6. International scope : The boundary-less nature of many computer networks, including the Internet, has created a temptation of its own. Now the entire world is well within reach by a touch of a button. This accessibility can tempt many intruders, many trying to circumvent their country's laws, and others thinking that an illegal act done in another country cannot be prosecuted in their own country. There are many temptations here.

7. The power to destroy : Computers seem to give this enormous invisible power to those who have them. This seemingly omniscient power may be a temptation to some. Although some of these temptations can still be found in the set of the old temptations, most of them are new.

Different Means of Delivery

What used to be the traditional means of carrying out an act such as stealing has changed. With the expanded set of outcome possibilities come expanded delivery systems for the crime. For example, let us go back to the check. The traditional way of cashing a check was to go to the bank. With computers facilitating new ways of banking, you can get your check cashed without ever visiting the bank, even in the middle of the night.

Complacent Society

A majority of computer-related actions are either deliberately ignored by society for fear of publicity or they are hailed as novel science: either members of society are still caught in the spell of the new wonder machine or that they have gotten so comfortable with the new wonder machine that they let their moral and ethical standards slide. Whatever it is, society is too complacent about computers, and until this attitude changes, computer ethics is likely to remain different from traditional ethics.

Ethical Muddles

With the possibility of numerous inputs from events, new difficulties of choice and justification cause ethical dilemmas, creating conflicting arguments and counterarguments on an input possibility of an event. This situation occurs because computers produce new situations that sometimes fall within our existing laws, rules, and moral principles, and sometimes fall outside these guidelines.

Technology and Values

Every now and then, a new technology is introduced in our midst, intended to make our lives easier. Some of these technologies do not last for more than a month; others take hold and become revolutionary in magnitude. Those which become successful most often influence society by creating new possibilities that may raise new moral and ethical concerns and consequently create vacuum s and new dilemmas in that society's basic sets of moral values. Computer technology has been one of these successful technologies. In its very short duration, it has had such a strong impact and influence on society, and if it continues the present trend unchecked, it is likely to become one of the greatest revolutions in the history of humankind, far greater than the agricultural and industrial revolutions. Society as a whole seems to be engulfed in this revolution and no cultural and/or society norm will, in the end if there is an end, be left unaffected.

Successful technological revolutions tend to create tempting situations that often result in a loosening of individual moral values, and the computer revolution tops that list. Worldwide cultural, political, and social underpinnings and values are undergoing a silent, but tremendous, change as new computer products come on the market and the revolution gathers momentum. It is moving so fast that it is stripping us of our ability to cope. Although we are constantly in need of new moral principles and new ethical values to fit the changing landscape, we cannot formulate, debate, and put in place such principles and values fast enough before they are outdated.

Technology and Values

More important still, even if we were able to come up with new values and moral principles, we would still lack the conceptual models within which such values and principles can be applied.

Many new situations resulting from the computer revolution are outdating our basic sets of values. Take, for example, the processes of handling forgeries in monitory currencies. There are laws on the books in almost every country against forgeries of any kind, let alone forgeries of currencies. These laws are further reinforced with individual moral values. One can, for example, reproduce and print millions of almost identical notes of a country's currency. Suppose even further that one produces a software program that reproduces the bank notes and enriches oneself. One's conscience of course tells the person that what one is doing is wrong, but the new technological advances are so tempting and making it so easy and so available that one can start rationalizing one's acts: I created or bought the program with my own money, I did all the work by myself, and after all it is highly unlikely that I can be caught because people cannot even tell the difference. All one is doing is creating a vacuum in one's basic set of values, and society needs to find a way to fill that moral vacuum so as to prevent individuals from taking moral vacations! As computer

and telecommunication revolutions pick up speed, creating new avenues of use and access such as the Internet and the World Wide Web , thus giving users room and reasons to take moral vacations, there is an urgent need to do the following:

Technology and Values

1. Formulate new laws to strengthen our basic sets of values, which are being rendered irrelevant by computer technology.

2. Construct a conceptual model in which the new laws can be applied successfully.

3. Launch a massive education campaign to make society aware of the changing environment and the impact such an environment is having on our basic values.

The first two objectives are beyond the scope of this book, which mainly focuses on the third objective, educating the public concerning ethical issues raised by the computer revolution.

ACM Association of Computing Machinery

The Association for Computing Machinery (ACM) is the world's largest

Educational and scientific computing organization. Its headquarters are in New York City. It provides the computing field's premier Digital Library and serves its members and the computing profession with leading-edge publications, conferences, and career resources.

In 1992, ACM's members take the responsibility to produce a code of

ethics that regular the ethics for computer professionals conduct. This Code is exist to help the professionals to make good decisions in their professional work. According to ACM, the following are the " General Moral Imperatives ", but not all, which are the most likely professionals to face:-

1. Contribute to society and human well-being

This principle concerning the quality of life of all people affirms an obligation to protect fundamental human rights and to respect the diversity of all cultures. An essential aim of computing professionals is to minimize negative consequences of computing systems, including threats to health and safety. When designing or implementing systems, computing professionals must attempt to ensure that the products of their efforts will be used in socially responsible ways, will meet social needs, and will avoid harmful effects to health and welfare.

2. Avoid harm to others

"Harm" means injury or negative consequences, such as undesirable loss of information, loss of property, property damage, or unwanted environmental impacts. This principle prohibits use of computing technology in ways that result in harm to any of the following: users, the general public, employees, employers. Harmful actions include intentional destruction or modification of files and programs leading to serious loss of resources or unnecessary expenditure of human resources such as the time and effort required to purge systems of "computer viruses".

3. Be honest and trustworthy

Honesty is an essential component of trust. Without trust an organization cannot function effectively. The honest computing professional will not make deliberately false or deceptive claims about a system or system design, but will instead provide full disclosure of all pertinent system limitations and problems. A computer professional has a duty to be honest about his or her own qualifications, and about any circumstances that might lead to conflicts of interest.

4. Be fair and take action not to discriminate

The values of equality, tolerance, respect for others, and the principles of

equal justice govern this imperative. Discrimination on the basis of race, religion, age, disability, national origin, or other such factors is an explicit violation of ACM policy and will not be tolerated. In a fair society, all individuals would have equal opportunity to participate in, or benefit from, the use of computer resources regardless of all previous factors. However, these ideals do not justify unauthorized use of computer resources nor do they provide an adequate basis for violation of any other ethical imperatives of this code.

5. Honor property rights including copyrights and patent

Violation of copyrights, patents, trade secrets and the terms of license agreements is prohibited by law in most circumstances. Even when software is not so protected, such violations are contrary to professional behavior. Copies of software should be made only with proper authorization. Unauthorized duplication of materials must not be condoned.

6. Give proper credit for intellectual property

Computing professionals are obligated to protect the integrity of intellectual property. Specifically, one must not take credit for other's ideas or work, even in cases where the work has not been explicitly protected by copyright, patent, etc.

7. Respect the privacy of others

Computing and communication technology enables the collection and exchange of personal information on a scale unprecedented in the history of civilization. Thus there is increased potential for violating the privacy of individuals and groups. It is the responsibility of professionals to maintain

the privacy and integrity of data describing individuals. This includes taking precautions to ensure the accuracy of data, as well as protecting it from unauthorized access or accidental disclosure to inappropriate individuals. Furthermore, procedures must be established to allow individuals to review their records and correct inaccuracies.

8. Honor confidentiality

The principle of honesty extends to issues of confidentiality of information whenever one has made an explicit promise to honor confidentiality or, implicitly, when private information not directly related to the performance of one's duties becomes available. The ethical concern is to respect all obligations of confidentiality to employers, clients, and users unless discharged from such obligations by requirements of the law or other principles of this Code.