

# Computer Ethics: A Primer

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**Abstract:** *Computers have become an integral part of all aspects of the society. The use and misuse of computers have increased dramatically. Computer ethics has emerged with the birth of computers. It is essentially a new discipline that addresses ethical issues in the use and management of computer technology. It simply consists of a set of moral principles that regulate the use of computers. It is part of the legal framework of our society. This paper provides a brief introduction to computer ethics.*

**Key Words:** *computer ethics, computing ethics, information ethics*

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## I. INTRODUCTION

Computers play an important role in our daily lives. They have become an integral part of all aspects of the modern society. We communicate with our friends with emails, read articles online, and interact socially online. Computer is an essential tool in almost every facet of business, industry, education, medicine, government, and other areas.

As special technology, computers presents some social and ethical issues. As technology advances, computers continue to have a greater impact on our social and private lives. The increasing ubiquity of computing technologies leads to the growing concern for the ethical aspects of computing. Computer technology is not the first or last technology that will raise social and ethical concerns. Nuclear power and atomic bomb did some years ago.

## II. ETHICS

Ethics is a branch of philosophy that determines what is right and wrong, good and bad, moral and immoral. It is a set of moral principles that govern the behavior of individuals. Understanding what is right or wrong often depends on realizing what harms can occur from one's actions or behavior. Computer ethics are ethics regarding computer and information technology. Although ethics is not a new concept, computer ethics is a relatively new discipline.

Computer ethics (also called the ethics of information) had its birth in the mid-1980s. It is a branch of applied ethics, just like business ethics and biomedical ethics. It is the application of classical ethical principles to the use computer technology. The scope of computer ethics embraces individual and collective practices that involve computer technology.

Code of ethics needs to be established within an organization to ensure that the organization is in compliance with regulatory requirements. Companies and professional organizations build codes of conduct and ethic. For example, professional organizations such as the Association for Computer Machinery (ACM), the Institute of Electrical and Electronics Engineers (IEEE), and the British Computer Society, have developed codes of ethics.

Educators are responsible to make students aware of the social ramifications of their work [1]. Computer science already recognizes that some computer ethics education is essential since the Accreditation Board for Engineering and Technology (ABET) requires it.

## III. TEN COMMANDMENTS OF COMPUTER ETHICS

The components of an ethical computer system are responsibility, ownership, access and personal privacy. Responsibility concerns the accuracy and accountability of the information. Ownership deals with who has the right to use the information. Access deals with who is allowed to use, store and process the information. Personal privacy addresses the question of who the information belongs to. In 1992, the Computer Ethics Institute published the Ten Commandments of Computer Ethics as follows [2].

1. Thou Shalt Not Use a Computer to Harm Other People.
2. Thou Shalt Not Interfere with Other People's Computer Work.
3. Thou Shalt Not Snoop around in Other People's Computer Files.
4. Thou Shalt Not Use a Computer to Steal.
5. Thou Shalt Not Use a Computer to Bear False Witness.
6. Thou Shalt Not Copy or Use Proprietary Software for Which You Have Not Paid.
7. Thou Shalt Not Use Other People's Computer Resources without Authorization or Proper Compensation.
8. Thou Shalt Not Appropriate Other People's Intellectual Output.
9. Thou Shalt Think about the Social Consequences of the Program You Are Writing or the System You Are Designing.
10. Thou Shalt Always Use a Computer in Ways That Insure Consideration and Respect for Your Fellow Humans.

#### IV. COMMON COMPUTER ETHIC ISSUES

Computer ethics often embrace a variety of concerns such as privacy invasion, software piracy, misrepresentation of data, computer crimes, fraud, hacking, social engineering, identity theft, deception, and computer viruses. When training on computer ethics, the following typical issues should be considered [3, 4].

- *Computers in the Workplace:* Computers alter and affect jobs radically. There is concern that computers would replace humans in many jobs, resulting in widespread job loss. Monitoring of employees for establishing production may be regarded as reasonable for some jobs. Use of surveillance for some employees to collect information for use in personnel actions may be deemed unfair and unethical. Each employee should consider ethical issues that are involved in carrying out his or her job.
- *Computer Crime:* Computer crime and security are certainly topics of concern when discussing computer ethics. Common computer crimes include hacking, snooping, information theft, software piracy, virus creation, and pornography. Hacking is often perceived as being part of criminal activities. Computer crimes are normally committed by trusted personnel who have permission to use the computer system. Both law enforcement and industry benefit from the crime reduction over the Internet.
- *Privacy and Anonymity:* One of the earliest computer ethics topics to arouse public interest was privacy. Privacy is generally regarded as an individual moral right that is often expressed in law. Use or sale of personal data may or may not be an invasion of privacy. Privacy is concerned with the justification of claims to limit access to personal information.
- *Intellectual Property:* One of the more controversial areas of computer ethics concerns the intellectual property rights connected with software ownership. Intellectual property laws exist to protect creative works by ensuring that only the creators benefit from marketing them. Intellectual property is usually protected by patents, copyright law, and trade secret law. Patent law offers an inventor a legitimate monopoly on the use of his or her invention. Copyright permissions should be explicit whenever appropriate. The issue of software piracy versus copyright protection is essential.
- *Professional Responsibility:* Global networks such as the Internet and are connecting people worldwide. Ethical responsibility begins by taking the ethical point of view. It includes protecting the public interest, demonstrating professional competence, preserving confidentiality, avoiding conflict of interest, and perpetuating social responsibility.
- *Globalization:* We are in the era of globalization and ubiquitous computing. The development of global networks, which allow data, voice, and video transmission through wired and wireless grids, has led to the development of an information-centered society and the connection of people all over the earth. The prospect of a global village in which everyone on the planet is connected to everyone else is breathtaking.
- *Digital divide:* A digital divide refers to an economic inequality regarding access to computer technologies. It is about the disparity between the technological haves and have-nots [5]. Gaps between the rich and the poor may become even worse, leading to new ethical considerations. At the global level, developing nations are digitally disadvantaged countries.

#### V. TEACHING COMPUTER ETHICS

There is an increased use of computers in both educational and industrial environments of today. Education on computer ethics is important to increase the level of people's awareness. Employers should train and educate their

employees and let them recognize the need for ethical standards. This will produce a more ethical computer workforce. Ethics plays a crucial role in shaping the environment in which computing professionals work.

Many educators feel that teaching computer ethics is important. Given the rapid pace of technological development in computing, students must be taught on how to be ethical computer scientists. This type of course will expose students to practical and ethical concerns dearly needed for their professional career.

Several schools are incorporating computer ethics into the social and computing curriculum. Education in computing ethics is problematic due to the diverse frames of ethics. One challenge in teaching ethics to student is deciding whether to cover it as a separate course or to distribute it across different courses. The subject is often taught by a professor who may be a philosopher rather than a computer scientist [6]. There is a dispute between philosophers and computer scientists as to who should teach computer ethics and who is more qualified to teach such courses.

## VI. CHALLENGES

Computer ethics is a complex field because it addresses individual's behavior which can be either secretive or cannot be measured. Computer ethics is based on issues that are constantly changing computer technology and people's attitudes [7]. Because of this, many questions often arise on how to teach computer ethics. Finding effective solutions for computer ethical issues is harder than ever in our modern society. Moral luck poses a challenge to theoretical approaches often deployed in computer ethics. The problem of the justification of moral judgment in computer ethics is yet to be resolved.

## VII. CONCLUSION

Computer ethics is a discipline that involves emerging issues and controversies. Computing technologies have the potential to raise ethical and social issues. An awareness and understanding of ethical issues of computing is gaining importance.

Computing has come a long way, technically, socially, and ethically. With computers becoming indispensable in every area of our lives, society is becoming more concerned about the possible negative social and ethical impacts caused by the technology.

Computer ethics is a relatively young, dynamic field with a bright future. More information on computer ethics can be found in books in [8-11] and several other books available in Amazon.com.

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