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ETHICAL AND SOCIAL ISSUES IN THE INFORMATION AGE

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To my mother Melesiane Nakatudde.

In memory of Kevina Nakwoga.



PREFACE TO THE SECOND EDITION

Since the publication of the first edition in 1997, there have been tremendous changes in the fields of computer science and information sciences. During this period, we have become more dependent than ever before on computer and telecommunication technology. As we, both individually and as nations, become more dependent on cyberspace technology, it has itself become a critical component of individual nation's security infrastructures that control power grids, gas and oil storage facilities, transportation, and all forms of national communication, including emergency services.

The recent rise in cyber attacks—many of them with lightning speed, affecting millions of computers worldwide, and causing billions of dollars in losses both to individuals and businesses—is an indication of how unprepared we are to handle such attacks not only today but also in the future. Such attacks are a mark of the poor state of our cyberspace security policies. The facts that there are no signs to indicate there is going to be a slowdown in such attacks, and that nations are not doing anything worth calling preventive, has heightened the need for an effective strategy to produce responsible professionals who can play an active role in the fight against computer and cyber attacks and vandalism.

As we look for such a strategy, technological development races on with new technologies that make our efforts and existing technologies obsolete in

shorter and shorter periods of time. For example, when I started to write the first edition of this book in 1996, computer networking and associated computer network security were not big, the Internet and associated dot.coms were yet to become commercialized and associated with big money, and mass global computer network attacks such as “Melissa,” “Love Boy,” and distributed denial of services (DDOS) attacks were unknown.

All these examples illustrate the speed at which the computing environment is changing and the need for continuous review of computer science education in both content and pedagogy. So the focus in this edition is to address those changes. I have made major changes in some of the chapters, re-arranged others, and added new ones to bring the book up-to-date with current issues.

Whereas the first edition of the book was based on the Computer Society and Association for Computing Machinery (ACM)’s Computing Curricula 1991, commonly referred to as CC1991, this second edition reflects the changes that have taken place since the CC1991 Computing Curricula and are incorporated in the new Computing Curricula 2001, commonly referred to as CC2001. This new curricula is a joint undertaking of the Computer Society of the Institute for Electrical and Electronic Engineers (IEEE-CS) and the Association for Computing Machinery (ACM).

RATIONALE FOR THE CHANGES

Four types of changes have been made from the first edition.

- (1) First, there is a considerable number of new scenarios (cases) in chapters where I thought such scenarios would contribute to the understanding of the material presented in those chapters.
- (2) Second, changes have been made in the content of many of the chapters by either adding new material, removing unwanted material, or both. These changes are sprinkled throughout the book to update the chapters and make them compatible with the requirements of the new CC2001 Computer Science Curricula in CS265s Social and Professional Issues.
- (3) Major changes have been made in the following chapters for the same reasons as those in number (2) above:

- (i) Chapter 4 (originally Chapter 3): Ethics and the Professions—The following subheadings have been added:
 - Making and Evaluating Ethical Arguments
 - Guilt and Making Ethical Decisions
 - Professionalism and Ethical Responsibilities
 - Harassment and Discrimination
- (ii) Chapter 5 (originally 4): Anonymity, Security, Privacy, and Civil Liberties—This new chapter heading replaces the old one; subheading additions:
 - Information Gathering, Databases, and Privacy have been added to reflect the growing controversy surrounding the legality of information gathering, databasing, and utilization by big business from unsuspecting customers.
 - Privacy Violations and Legal Implications
 - Privacy Protection and Civil Liberties
- (iii) Chapter 7 (originally 6): Social Context of Computing—This new chapter heading is a replacement of the old heading. Since the publication of the first edition, a new field in social computing, the digital divide, has sprung up and is being discussed in a number of higher-education institutions. I wanted my readers to be aware of the digital divide and associated issues such as access, capacity, technology, and enabling environments. Most of these issues are actually included in the new CS265 syllabus.
- (iv) Chapter 8 (originally 7): Software Issues: Risks and Liabilities—The chapter heading has been changed and the following subheadings added:
 - Nature of Software: Complexity
 - Risks, to give perspective to the enormity of the problem and risks involved
 - Risk Assessment and Management, to give the reader strategies to deal with software risks
 - Risks and Hazards in Workplace Systems
- (v) Chapter 11 (originally 9): Cyberspace and CyberEthics—Chapter heading has been changed and the following subheadings added:
 - Introduction
 - Cyberspace Safeguards

- Regulating and Censoring Cyberspace
 - The Social Value of Cyberspace
 - Global Cyberethics
- (4) The following two chapters have been added:
- (i) Chapter 1: Introduction to Social and Ethical Computing.—This chapter was added for two reasons: (a) to create an environment for the students in which they will have an understanding of what the computer is, the major players in the computing discipline, the history of computer crimes, the security and vulnerabilities of computer networks, and the need for responsible computing; (b) to meet the requirements of CS265s-SP1.
 - (ii) Chapter 9: Computer Crimes—Again there are two reasons for the addition of this chapter: (a) to create a context in which the students can discuss the major computer crimes that have occurred, the types of such crimes, their topology, their costs to individuals and society, and the detection and prevention of those crimes; (b) to meet the requirements of CS265s-SP8.

Finally, three appendixes, A, B, and C have been added. Appendix A contains subsection 1201(a)3 of the Digital Millennium Copyright Act discussed in Chapter 11. Appendix B contains the False Claims Act discussed in Chapter 4, and Appendix C contains eighteen student projects covering all the material presented in the book.

CHAPTER OVERVIEW

The book is now divided into eleven chapters as follows:

Chapter 1: Introduction to Social and Ethical Computing: gives an overview of the history of computing science in hardware, software, and networking. It also discusses the development of computer crimes and the current social and ethical environment. Further, computer ethics is defined, and a need to study computer ethics is emphasized.

Chapter 2: Morality and the Law: defines and examines personal and public morality, the law, looking at both conventional and natural law, and the

intertwining of morality and the law. Together with Chapter 3, it gives the reader the philosophical framework needed for the remainder of the book.

Chapter 3: Ethics, Technology, and Value: builds on Chapter 2 in setting up the philosophical framework for the book, discussing moral theories and problems in ethical relativism. In light of the rapid advances in technology, the chapter discusses the moral and ethical premises and their corresponding values in the changing technology arena.

Chapter 4: Ethics and the Professions: examines the changing nature of the professions and how they cope with the impact of technology on their fields. Professional and ethical responsibilities based on community values and the law are also discussed. And social issues including harassment and discrimination are thoroughly covered.

Chapter 5: Anonymity, Security, Privacy, and Civil Liberties: surveys the traditional ethical issues of privacy, security, and anonymity, and analyzes how these issues are affected by computer technology. Information gathering, databasing, and civil liberties are also discussed.

Chapter 6: Intellectual Property Rights and Computer Technology: discusses the foundations of intellectual property rights and how computer technology has influenced and changed the traditional issues of property rights, in particular intellectual property rights.

Chapter 7: Social Context of Computing: considers the three main social issues in computing, namely, the digital divide, workplace issues such as employee monitoring, and health risks, and how these issues are changing with the changing computer technology.

Chapter 8: Software Issues: Risks and Liabilities: revisits property rights, responsibility, and accountability with a focus on computer software. The risks and liabilities associated with software and risk assessment are also discussed.

Chapters 9: Computer Crimes: surveys the history and examples of computer crimes, their types, costs on society, and strategies for detection and prevention.

Chapter 10: New Frontiers for Computer Ethics: Artificial Intelligence, Cyberspace, and Virtual Reality: discusses the new frontiers of ethics: virtual reality, artificial intelligence, and the Internet, and how these new frontiers are affecting the traditional ethical and social issues.

Chapter 11: Cyberspace and Cyberethics: discusses the new realities of global computer networks, the intertwining of global economies, monopolies and their economic implications, globalization, emerging issues such as global ethics, culture, and the development of a lingua franca for the Internet.

AUDIENCE

This book satisfies the requirements of the new CC2001 Computer Science Curricula for undergraduates: CS265s Social and Professional Issues. Students in related disciplines such as computer information and information management systems and library sciences will also find this book informative.

The book will also be good for anyone who is concerned with how all traditional ethical and social issues such as privacy, civil liberties, security, anonymity, and workplace issues such as harassment and discrimination are handled in the new computer technology environment.

In addition, anybody interested in reading about network, computer, and data security will also find the book very helpful.

ACKNOWLEDGMENTS

I appreciate all the help I have received from colleagues who offered ideas, criticism, and suggested materials. Special thanks to my dear wife, Dr. Immaculate Kizza, who offered a considerable amount of help, constructive ideas, and wonderful support. To professor Andy Novobilski and to my students, past and present—thank you for all the suggestions and criticism.

*Joseph Migga Kizza
Chattanooga, Tennessee*



PREFACE TO THE FIRST EDITION

Computer technology, barely fifty years old, has enormously transformed human society. The computer revolution, as many have termed it, is quietly but surely affecting every human being on earth in a multitude of ways. Both large and small institutions and individuals from all walks of life have come to rely on information, more so today than ever before.

Although experiences on the whole have been positive thus far, troubling ethical and social issues are coming to our attention. The security of information we all have come to rely on is no longer guaranteed; individual norms of conduct and ethical behavior are changing. Computer technological development is outpacing the ability of our legal systems. Traditional ethical issues like security, privacy, integrity, responsibility, anonymity, property rights, and related social concerns are also greatly affected by our highly technological environment.

Many ethical questions that used to be answered easily have become more complicated. Like symptoms of a disease, if these concerns are not diagnosed and treated in a timely fashion, they may become untreatable and eventually wreak havoc on human lives. The book analyzes the effects of computer technology on traditional ethical and social issues. In particular, I explore the consequences of relatively new computer technologies such as virtual reality, artificial intelligence, and the Internet.

Anyone concerned with how traditional ethical and social issues like privacy, security, anonymity, and workplace issues are handled in the new com-

puter technology environment will find *Ethical and Social Issues in the Information Age* very helpful. But the book is targeted at college students studying information technology, engineering, and, to a lesser extent, the arts and social sciences. Students in computer and engineering sciences, computer information and information management systems, and library sciences will also find the book particularly useful. Practitioners, especially those working in information-related businesses like banking, insurance, and the media, will also find considerable coverage of the materials they need.

Writing a book like this one, which encompasses a large number of disciplines, requires considerable and dedicated effort and research. I have tried to be as inclusive as possible and at the same time focus on issues without being too detailed.

ACKNOWLEDGMENTS

I am appreciative of the considerable help I received from colleagues who offered ideas and criticism. My dear wife, Dr. Immaculate Kizza, spent a considerable amount of time reviewing the manuscript, offering alternative ideas, editing, and being wonderfully supportive. I am especially grateful to Dr. Donald Klinefelter, who read, critiqued, and offered suggestions on the morality and ethics part of the book. To all those people, who in one way or another helped in any form but whose names I have not included here, thank you.

Joseph Migga Kizza



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