TEXTS IN COMPUTER SCIENCE

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Joseph Migga Kizza

Ethical and Social Issues in the Information Age

Third Edition

Springer

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In memory of our mothers:

Melesiane Nakatudde and Kevina Nalwoga.

PREFACE TO THE THIRD EDITION

As I wrote in my second edition preface, since the publication of the second edition in 2003, there have been tremendous changes in the fields of computer science and information sciences. During this period, we have become more dependent on computer and telecommunication technology than ever before. As we, individually and as nations, become more dependent on cyberspace technology, it has itself, in turn, become a critical component of individual nations' security infrastructures that control power grids, gas and oil storage facilities, transportation and all forms of national communication, including emergency services. This intertwining of security components with cyberspace has elevated it to an important security component for not only individuals but nations as well.

The recent rise in cyberattacks, many of them with lightening speed, affecting millions of computers worldwide and in the process causing billions of dollars in losses to individuals and businesses, is an indication of how unprepared we are to handle such attacks not only now but also in the future. It is also a mark of the poor state of our cyberspace security policies, the cyberspace on which we have come to depend so much, and the vulnerability of us all. The fact that there are no signs yet to indicate that there is going to be a slow down in such attacks, and that nations are 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 on which they are based obsolete in shorter and shorter periods. For example, when I started to write the first edition 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 like “Malissa”, “Love Boy”, and Distributed Denial of Services (DDOS) were unknown.

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

RATIONALE FOR THE CHANGES

The following three chapters have been added to this edition:

(1) Computer Networks and Online Crimes—To cover the basic core knowledge of computer networks for those who are not yet exposed to computer networks. It then discusses the major online crimes and further discusses defense against online crimes. This chapter has been added because since the second edition major computer crimes are now online and the remedies for them are based on the computer network. For a student to understand computer crimes today, a knowledge of computer networks and the jargons that comes with it is necessary.

(2) Computer Crime Investigation—While we teach the ethics of computer use and discuss the crimes, we must follow that with ways and technologies that are currently being used by law enforcement agencies and others by collecting digital evidence, analyzing it, presenting it in court, and probably apprehending the criminal. This knowledge is what we want the student to acquire in this chapter.

(3) Biometrics—Teaching students about the ethical use of computers and discussing with them the types of major computer crimes and how to mitigate such crimes through use of advanced technologies, also requires a thorough discussion of current and more advanced techniques and technologies in access control. We do this by discussing the most reliable and upcoming technique and associated technologies under biometrics.

CHAPTER OVERVIEW

The book is now divided into fourteen chapters as follows:

Chapter 1—Introduction to the Study of 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. It, together with chapter 3, gives the reader the philosophical framework needed for the remainder of the book.

Chapter 3—Ethics, Technology, and Values builds upon chapter 2 in setting up the philosophical framework for the book discussing moral theories and problems in ethical relativism. Based on these and 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, and Privacy and Civil Liberties surveys the traditional ethical issues of privacy, security, 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 like 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 of detection and prevention.

Chapter 10—New Frontiers for Ethical Consideration: 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 like global ethics, culture, and the development of the lingua franca for the Internet.

Chapter 12—Computer Networks and Online Crimes begins by presenting the core basics of computer networks for those readers who have never taken a course in computer networks. Then the chapter discusses the major online crimes and ends by a discussion of techniques and technologies in use to mitigate these crimes.

Chapter 13—Computer Crime Investigations discusses what constitutes digital evidence, the collection and analysis of digital evidence, chain of custody, the writing of the report, and the possible appearance in court as an expert witness.

Chapter 14—Biometrics starts by discussing the different techniques in access control. Biometric technologies and techniques are then introduced to be contrasted with the other known techniques. Several biometrics and biometric technologies are discussed.

AUDIENCE

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

It is also good for anyone who is concerned with how all traditional ethical and social issues like privacy, civil liberties, security, anonymity, and workplace issues like 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.

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