8th edition

ETHICS

for the information age

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for the information age

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Preface

Computers and high-speed communication networks are transforming our world. These technologies have brought us many benefits, but they have also raised many social and ethical concerns. My view is that we ought to approach every new technology in a thoughtful manner, considering not just its short-term benefits, but also how its long-term use will affect our lives. A thoughtful response to information technology requires a basic understanding of its history, an awareness of current information-technology-related issues, and a familiarity with ethics. I have written *Ethics for the Information Age* with these ends in mind.

Ethics for the Information Age is suitable for college students at all levels. The only prerequisite is some experience using computers and the Internet. The book is appropriate for a stand-alone "computers and society" or "computer ethics" course offered by a computer science, business, or philosophy department. It can also be used as a supplemental textbook in a technical course that devotes some time to social and ethical issues related to computing.

As students discuss controversial issues related to information technology, they have the opportunity to learn from one another and improve their critical thinking skills. The provocative questions raised at the end of every chapter, together with dozens of in-class exercises, provide many opportunities for students to express their views, learn from their classmates, and refine their positions on important issues. My hope is that through these discussions students will get better at evaluating complex issues and defending their conclusions with facts, sound values, and rational arguments.

WHAT'S NEW IN THE EIGHTH EDITION

The most significant change in the eighth edition is the addition of Appendix B that focuses on the structure of logical arguments and some common logical fallacies. The eighth edition also contains four sidebars with practical advice about how to enhance privacy and security. The sidebars explain

- how to limit the amount of information Google saves about your searches
- how to limit the amount of personal information Facebook releases to others
- how to create a secure password
- how to protect your computer and other Internet-connected devices

The eighth edition covers many new developments and controversies related to the introduction, use, and abuse of information technology in modern society, including:

- safety concerns arising from accidents involving self-driving vehicles
- Cambridge Analytica gaining access to personal information from as many as 87 million Facebook users
- foreign interference in the 2016 US Presidential election using social media platforms
- police obtaining cell phone location records without a search warrant
- the US Supreme Court decision that has led to the invalidation of hundreds of software patents
- whether copying declaring code in APIs should be considered fair use of copyrighted material
- the dispute between the FBI and Apple about unlocking the encrypted iPhone of a terrorist
- how unrepresentative test-data sets can lead to biased artificial-intelligence software
- security risks associated with the "Bring Your Own Device" movement
- distributed denial-of-service attacks carried out by botnets of Internet-of-Things devices, such as baby monitors and security cameras
- the debate whether gig workers should be considered employees or independent contractors
- the new stance of the FCC regarding net neutrality
- the rise of Craigslist and the decline of print newspapers
- final court resolution of the Google Books controversy
- the shift in credit card fraud from point-of-sale fraud to "card not present" fraud
- cloud computing and cloud storage

Finally, I have updated a significant number of facts and figures throughout the book.

ORGANIZATION OF THE BOOK

The book is divided into 10 chapters. Chapter 1 has several objectives: to get the reader thinking about how social conditions can lead to the development of new technologies and how the adoption of new technologies can lead to social change; to provide the reader with an introduction to the history of computing, networking, and information storage and retrieval; and to help the reader understand how the introduction of information technology has raised some new ethical issues.

Chapter 2 is an introduction to ethics. It presents nine different theories of ethical decision making, weighing the pros and cons of each one. Five of these theories—Kantianism, act utilitarianism, rule utilitarianism, social contract theory, and virtue ethics—are deemed the most appropriate "tools" for analyzing moral problems in the remaining chapters.

Chapters 3–10 discuss a wide variety of issues related to the introduction of information technology into society. I think of these chapters as forming concentric rings around a particular computer user.

Chapter 3 is the innermost ring, focusing on communications over cellular networks and the Internet. Issues such as the increase in spam, political activism over social media, government censorship, identity theft, sexting, revenge porn, and Internet addiction raise important questions related to trust, quality of life, free speech, and whether new media are strengthening or weakening democracies.

The next ring, Chapter 4, deals with the creation and exchange of intellectual property. It discusses intellectual property rights; legal safeguards for intellectual property; the definition of fair use; the impact of digital media, peer-to-peer networks, and cyberlockers; software copyrights and software patents; the legitimacy of intellectual property protection for software; and the rise of the open-source movement.

Chapter 5 focuses on information privacy. What is privacy exactly? Is there a natural right to privacy? How do others learn so much about us? The chapter examines the electronic trail that people leave behind when they use a cell phone, drive a car, search the Web, use social media, make credit card purchases, open a bank account, go to a physician, or apply for a loan, and it explains how mining data to predict consumer behavior has become an important industry. It also provides several examples where companies have gone too far with their collection of personal information, and the consumer or political backlash that has resulted.

Chapter 6 focuses on privacy and the US government. Using Daniel Solove's taxonomy of privacy as our organizing principle, we look at how the government has steered between the competing interests of personal privacy and public safety. We consider US legislation to restrict information collection and government surveillance; government regulation of private databases and abuses of large government databases; legislation to reduce the dissemination of information and legislation that has had the opposite effect; and finally government actions to prevent the invasion of privacy as well as invasive government actions. Along the way, we discuss the implications of the USA PATRIOT Act and the debate over the REAL ID Act to establish a de facto national identification card.

Chapter 7 focuses on the vulnerabilities of networked computers. A case study focuses on the release of the Firesheep extension to the Firefox Web browser. A section on malware discusses viruses, worms, cross-site scripting, drive-by downloads, Trojan horses, ransomware, rootkits, spyware, botnets, and more. The chapter covers phishing, spear phishing, SQL injection, denial-of-service attacks, and distributed denial-of-service attacks, and how these tools are employed by criminal organizations and even nation states. We conclude with a discussion of the risks associated with online voting.

Computerized system failures have led to inconvenienced consumers, lost income for businesses, the destruction of property, human suffering, and even death. Chapter 8 describes some notable software system failures, including the story of the Therac-25 radiation therapy system. It also covers an important contemporary problem: the safety of self-driving automobiles. New sections focus on two fatal accidents: the Florida accident involving a Tesla Model S and the Arizona accident in which an Uber test vehicle struck and killed a pedestrian. The chapter also discusses the reliability of computer simulations, the emergence of software engineering as a distinct discipline, and the validity of software warranties.

Chapter 9 is particularly relevant for those readers who plan to take jobs in the computer industry. The chapter presents a professional code related to computing, the Software Engineering Code of Ethics and Professional Practice, followed by an analysis of the code. Several case studies illustrate how to use the code to evaluate moral problems related to the use of computers. The chapter concludes with an ethical evaluation of whistle-blowing, an extreme example of organizational dissent.

Chapter 10 raises a wide variety of issues related to how information technology has impacted the world of work and the distribution of wealth. Topics include automation, the rise of computerized systems relying on artificial intelligence, telework, workplace monitoring, the gig economy, and globalization. Does automation increase unemployment? Will improvements in artificial intelligence lead to most jobs being taken over by machines? Is there a "digital divide" separating society into "haves" and "have-nots"? Is information technology widening the gap between rich and poor? These are just a few of the important questions the chapter addresses.

NOTE TO INSTRUCTORS

In December 2013, a joint task force of the Association for Computing Machinery and the IEEE Computer Society released the final draft of *Computer Science Curricula 2013* (www.acm.org/binaries/content/assets/education/cs2013_web_final.pdf). The report recommends that every undergraduate computer science degree program incorporate instruction related to Social Issues and Professional Practice through "a combination of one required course along with short modules in other courses" (*Computer Science Curricula 2013*, p. 193). *Ethics for the Information Age* covers nearly all of the core and elective material described in the report, with the notable exception of Professional Communications. Table 1 shows the mapping between the other topics within Social Issues and Professional Practice and the chapters of this book.

The organization of the book makes it easy to adapt to your particular needs. If your syllabus does not include the history of information technology, you can skip the

Topic	*Chapter(s) or Appendix*
SP/Social Context	3, 10
SP/Analytical Tools	2, B
SP/Professional Ethics	9
SP/Intellectual Property	4, A
SP/Privacy and Civil Liberties	5, 6
SP/Sustainability	8, 10
SP/History	1
SP/Economies of Computing	10
SP/Security Policies, Laws, and Computer Crimes	7

TABLE 1 The topics of the Social Issues and Professional Practice Knowledge Area in *Computer Science Curricula 2013* mapped to the chapters and appendices of this book.

middle three sections of Chapter 1 and still expose your students to examples motivating the formal study of ethics in Chapter 2. After Chapter 2, you may cover the remaining chapters in any order you choose, because Chapters 3–10 do not depend on one other.

Many departments choose to incorporate discussions of social and ethical issues throughout the undergraduate curriculum. The independence of Chapters 3–10 makes it convenient to use *Ethics for the Information Age* as a supplementary textbook. You can simply assign readings from the chapters most closely related to the course topic.

SUPPLEMENTS

The following supplements are available to qualified instructors on Pearson's Instructor Resource Center. Please contact your local Pearson sales representative or visit www.pearsonhighered.com/educator to access this material.

- An instructor's manual provides tips for teaching a course in computer ethics. It also contains answers to all of the review questions.
- A test bank contains nearly 500 multiple-choice, fill-in-the-blank, and essay questions that you can use for quizzes, midterms, and final examinations.
- A set of PowerPoint lecture slides outlines the material covered in every chapter.

FEEDBACK

Ethics for the Information Age cites nearly a thousand sources and includes dozens of ethical analyses. Despite my best efforts and those of many reviewers, the book is bound to contain errors. I appreciate getting comments (both positive and negative), corrections, and suggestions from readers. You can reach me through my Web site: www.michaeljquinn.net.

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