Ethics
for the Information Age
SECOND EDITION
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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. 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 learn from each other and improve their critical thinking skills. The provocative discussion questions raised in every chapter, combined with dozens of in-class exercises, provide many opportunities for students to express their viewpoints. They will learn how to evaluate complex issues and logically defend their conclusions.

WHAT’S NEW IN THE SECOND EDITION

Rapid changes in the field of information technology make the study of ethics in this area exciting and challenging. Nearly every day the media report on a new invention, controversy, or court ruling. The Second Edition of *Ethics for the Information Age* has been updated to include many important developments. Among them are:

- The emergence of the BitTorrent network and how some universities are responding to the problem to illegal file sharing
- The U.S. Supreme Court decision in the entertainment industry lawsuit against peer-to-peer network operators Grokster and StreamCast
- Ramifications of the USA PATRIOT Act and the debate surrounding the renewal of its most controversial provisions
• Passage of the Real ID Act, which may result in a de facto national identification card for the United States
• The creation of autonomous robots controlled by artificial intelligence
• The emergence of China and India as legitimate competitors in the global information technology industry

Eight end-of-chapter interviews with leaders from industry and academia have been added to provide important new insights and perspectives to the book. Besides being informative, these interviews can serve as catalysts for in-class discussions.

Other sections have been added or enhanced in response to requests from readers. A new appendix describes what plagiarism is and how to avoid it. The history of the Internet is now told in greater detail. A new section discusses the problem of Internet addiction. An extended example illustrates how public key encryption works. Numerous ethical analyses have been sharpened. Throughout the book, new references to the latest news stories and analyses ensure that facts and figures are as up-to-date as possible.

ORGANIZATION OF THE BOOK
The book is divided into nine chapters. Chapter 1 has three objectives: to get the reader thinking about the process of technological change; to present a brief history of computing, networking, and information storage and retrieval; and to provide examples of moral problems brought about by the introduction of information technology.

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

Chapters 3–8 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, dealing with what can happen when people communicate over the Internet using the Web, email, and chat rooms. Issues such as the increase in spam, easy access to pornography, and Internet addiction raise important questions related to quality of life, free speech, and censorship.

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, abuses of peer-to-peer networks, the rise of the open-source movement, and the legitimacy of intellectual property protection for software.

Chapter 5 focuses on privacy. What is privacy exactly? Is there a natural right to privacy? How do others learn so much about us? The chapter describes the electronic trail that people leave behind when they use cell phones, make credit card purchases, open bank accounts, or apply for loans. Other topics in this chapter include the difference between public information and public records, covert governmental surveillance,
the USA PATRIOT Act, data mining, identity theft, encryption, and attempts to create anonymous digital cash.

Chapter 6 focuses on the vulnerabilities of networked computers. Students will learn the difference between a virus, a worm, and a Trojan horse. The chapter chronicles the transformation of hacker culture, the emergence of phone phreaks, and the hacker crackdown of 1990. The chapter also discusses denial-of-service attacks, the reliability of proposed on-line voting systems, and the important role system administrators play in keeping computers and networks secure.

Computerized system failures have led to lost business, the destruction of property, human suffering, and even death. Chapter 7 describes some notable software system failures, including the story of the Therac-25 radiation therapy system. It also discusses the reliability of computer simulations, the emergence of software engineering as a distinct discipline, the validity of software warranties, and the controversial Uniform Computer Information Transaction Act.

Chapter 8 raises a wide variety of issues related to how information technology has impacted work and wealth. Topics include workplace monitoring, telecommuting, and globalization. Does automation increase unemployment? Is there a “digital divide” separating society into “haves” and “have nots?” Is information technology widening the gap between rich and poor? Are we systematically excluding the poor from opportunities to succeed in our high-tech economy? These are just a few of the important questions the chapter addresses.

Chapter 9 is particularly relevant for those readers who plan to become software engineers. The chapter presents the Software Engineering Code of Ethics and Professional Practice, followed by an analysis of the code and a list of fundamental principles underlying it. Several case studies illustrate how to use the code as a tool for the evaluation of moral problems related to software engineering. The chapter concludes with an ethical evaluation of whistle blowing, an extreme example of organizational dissent.

NOTE TO INSTRUCTORS

In December 2001 a joint task force of the IEEE Computer Society and the Association for Computing Machinery released the final draft of Computing Curricula 2001 (www.computer.org/education/cc2001/final). The report recommends that every undergraduate computer science degree program incorporate 40 hours of instruction related to social and professional issues related to computing. For those departments that choose to dedicate an entire course to these issues, the report provides a model syllabus for CS 280T, Social and Professional Issues. Ethics for the Information Age covers all of the major topics listed in the syllabus. Table 1 shows the mapping between the 10 units of CS 280T 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 easily skip the middle three sections of Chapter 1 and still expose your students to examples motivating
Table 1: Mapping between the units of the Social and Professional Issues course in Computing Curricula 2001 and the chapters in this book.

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<thead>
<tr>
<th>Unit</th>
<th>Name</th>
<th>Chapter(s)</th>
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<tbody>
<tr>
<td>SP1</td>
<td>History of computing</td>
<td>1</td>
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<tr>
<td>SP2</td>
<td>Social context of computing</td>
<td>1, 3, 8</td>
</tr>
<tr>
<td>SP3</td>
<td>Methods and tools of analysis</td>
<td>2–9</td>
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<tr>
<td>SP4</td>
<td>Professional and ethical responsibilities</td>
<td>9</td>
</tr>
<tr>
<td>SP5</td>
<td>Risks and liabilities of computer-based systems</td>
<td>7</td>
</tr>
<tr>
<td>SP6</td>
<td>Intellectual property</td>
<td>4</td>
</tr>
<tr>
<td>SP7</td>
<td>Privacy and civil liberties</td>
<td>5</td>
</tr>
<tr>
<td>SP8</td>
<td>Computer crime</td>
<td>3, 5, 6</td>
</tr>
<tr>
<td>SP9</td>
<td>Economic issues in computing</td>
<td>8</td>
</tr>
<tr>
<td>SP10</td>
<td>Philosophical frameworks</td>
<td>2</td>
</tr>
</tbody>
</table>

the formal study of ethics in Chapter 2. After Chapter 2, you may cover the remaining chapters in any order you choose, because Chapters 3–9 do not depend on each other.

Many departments choose to incorporate discussions of social and ethical issues throughout the undergraduate curriculum. The independence of Chapters 3–9 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 Addison-Wesley's Instructor Resource Center. Please contact your local Addison-Wesley Sales Representative, or visit www.aw.com/irc 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 more than 250 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 hundreds of sources and includes dozens of ethical analyses. Despite the best efforts of myself and many others, the book is bound to contain errors. I appreciate getting comments (both positive and negative), corrections, and suggestions from readers. Please send them to InformationAge@cs.orst.edu or Michael J. Quinn, Oregon State University, School of Electrical Engineering and Computer Science, Corvallis, OR 97331.
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Michael J. Quinn
Corvallis, Oregon
We never know how high we are
Till we are called to rise;
And then, if we are true to plan,
Our statures touch the skies.
The heroism we recite
Would be a daily thing.
Did not ourselves the cubits warp
For fear to be a king.

—EMILY DICKINSON, Aspiration

I dedicate this book to my children: Shauna, Brandon, and Courtney.

Know that my love goes with you, wherever your aspirations may lead you.