The Cambridge Handbook of **Information and Computer Ethics**

Information and Communication Technologies (ICTs) have profoundly changed many aspects of life, including the nature of entertainment, work, communication, education, health care, industrial production and business, social relations and conflicts. They have had a radical and widespread impact on our moral lives and hence on contemporary ethical debates. *The Cambridge Handbook of Information and Computer Ethics* provides an ambitious and authoritative introduction to the field, with discussions of a range of topics including privacy, ownership, freedom of speech, responsibility, technological determinism, the digital divide, cyber warfare and online pornography. It offers an accessible and thoughtful survey of the transformations brought about by ICTs and their implications for the future of human life and society, for the evaluation of behaviour, and for the evolution of moral values and rights. It will be a valuable book for all who are interested in the ethical aspects of the information society in which we live.

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Preface

Luciano Floridi

Information and Communication Technologies (ICTs) have profoundly altered many aspects of life, including the nature of entertainment, work, communication, education, health care, industrial production and business, social relations and conflicts. As a consequence, they have had a radical and widespread impact on our moral lives and hence on contemporary ethical debates. Consider the following list: PAPA (privacy, accuracy, intellectual property and access); 'the triple A' (availability, accessibility and accuracy of information); ownership and piracy; the digital divide; infoglut and research ethics; safety, reliability and trustworthiness of complex systems; viruses, hacking and other forms of digital vandalism; freedom of expression and censorship; pornography; monitoring and surveillance; security and secrecy; propaganda; identity theft; the construction of the self; panmnemonic issues and personal identity; new forms of agency (artificial and hybrid), of responsibility and accountability; roboethics and the moral status of artificial agents; e-conflicts; the re-prioritization of values and virtues . . . these are only some of the pressing issues that characterize the ethical discourse in our information societies. They are the subject of information and computer ethics (ICE), a new branch of applied ethics that investigates the transformations brought about by ICTs and their implications for the future of human life and society, for the evolution of moral values and rights, and for the evaluation of agents' behaviours.

Since the seventies, ICE has been a standard topic in many curricula. In recent years, there has been a flourishing of new university courses, international conferences, workshops, professional organizations, specialized publications and research centres. However, research, and the corresponding teaching materials, have so far been largely influenced by professional and technical approaches, addressing mainly applied problems in legal, social and technological contexts. This trend is understandable. ICE emerged in recent decades not as a mere intellectual exercise, or something cooked up in the ivory tower of academia, but as an increasingly felt need for clarifications and guidelines in the ethically messy world generated by the fastest changes ever experienced by humanity. This bottom-up process has given to ICE an enviable platform of real and substantial evidence with which to work, from industry standards to social issues, from political decisions to legal requirements. However, this wealth of empirical data and grounding problems has come at a theoretical cost. Today, ICE is like a pyramid: it has a very large

empirical base, but a rather slim top of theoretical insights. To use a different metaphor, imagine three runners on a typical oval track. In information societies around the world we find that one of the runners is well ahead, and that is technology and its applications. ICT has outpaced the second runner, represented by national and international legal systems and legislation, which are following, rather than leading, the race in almost any technological context. Last comes our conceptual understanding, the third runner. In ICT, we often innovate first, then try to regulate, and finally seek to understand what is actually happening. In theory, we all know perfectly well that the safest and most reasonable way of proceeding would be exactly the opposite. In practice, each runner requires different amounts of resources: *thinking* is always a slower process than *deciding*, which inevitably takes more time than *doing*. This book seeks to redress the situation. It is an attempt to give a substantial push to the third runner, to make sure that the distance between technology and the full, conceptual comprehension of it is as short as possible. For this reason, it is entirely and exclusively dedicated to conceptual approaches to ICE.

The book provides a philosophical introduction to the most important conceptual issues in ICE. It is to be hoped that it will serve as a groundbreaking resource as well as a timely, comprehensive review for both students and general readers alike. It is meant to engage a wide audience, from undergraduates, who need to study the new computational and informational turn in ethics, to teachers in need of a reliable textbook, to researchers interested in broadening their expertise, and to members of the general public, who might be curious about the ethical aspects of the information society in which they live.

The book comprises fifteen newly commissioned chapters. Each of them provides an authoritative, philosophical survey of the fundamental themes, problems, arguments and theories, which constitute the innovative field of ICE. Combining the virtues of careful scholarship and lucid exposition, each chapter is planned to be usable as a self-standing introduction to its topic. In line with a more theoretical approach, examples are used to illustrate and substantiate conceptual analyses, not to support a mere case-based approach, which often turns out to be insufficiently enlightening and generalizable. The first chapter is an introduction explaining the nature of the new paradigm in applied ethics. The chapters are followed by an epilogue in which I have outlined the possible development of the field, in a world increasingly globalized.

The book does not provide purely abstract discussions with no practical applications, but rather offers a broad and objective introduction to the conceptual understanding of the real-world problems that affect life in the information society, in a style that is both accessible and didactically useful. Here is a quick guide to its contents.

guidelines have been more successful among professionals; what sort of ICT moral issues, if any, may not be subject to an ethical analysis in terms of the old paradigms and may require radical innovations; how ethics may help to approach, formulate and solve ICT moral problems.

Chapter 5 Information ethics, Luciano Floridi

Keywords: artificial agents, environmental ethics, foundation of computer ethics, information ethics.

Since the nineties, a new approach to computer ethics, known as information ethics, has been developed by several researchers and especially by the IEG (Information Ethics Group) in Oxford. Information ethics may be briefly described as an extension of environmental ethics to artificial contexts (cyberspace, or more generally the so-called infosphere) inhabited by artificial agents. This chapter outlines the nature and scope of information ethics, some of the difficulties it faces in its application to practical issues in computer ethics, and the criticisms that have been brought against it.

Part III Ethical issues in the information society

This section is dedicated to specific topics and problems, in ICE, characterizing social and individual life in the information society. These are organized by dividing them into standard thematic areas and hence six chapters.

Chapter 6 Social issues in computer ethics, Bernd Carsten Stahl

Keywords: ownership, intellectual property, copyright and open source software.

The computer revolution, by de-materializing artefacts, products and services and transforming them in strings and streams of digits, has profoundly affected concepts such as *ownership*, *intellectual property*, *copyright*, fair sharing and use, as well as voluntary collaboration and *open source software*. This chapter discusses some of the classic problems arising in these contexts.

Chapter 7 Rights and computer ethics, John Sullins

Keywords: freedom of speech and pornography; privacy, surveillance and trust.

This chapter continues the previous analysis by investigating individuals' rights in the information society. The information society is built on information and communication technologies. Precisely because the exchange of data and information is so facilitated, some problems that have affected individuals in the past acquire macroscopic dimensions. The chapter discusses the classic issue of how freedom of speech and its potential abuse (especially pornography and politically, socially or religiously discriminating contents) may be

ethically regulated. It then investigates several theories of informational privacy, which have been developed to tackle the problems arising in environments which are at risk of being dominated by 'Big Brother' or 'Panopticon' strategies (the surveillance society).

Chapter 8 Conflict, security and computer ethics, John Arquilla

Keywords: cryptography, cyber terrorism, hacktivism, information warfare.

Information has always played a crucial role in warfare and in national security issues. Naturally, information warfare – namely the use and management of information resources in pursuit of a competitive advantage over an opponent – has followed the development both of information technologies and of society. The more advanced the former are, and the closer the latter is to being an information society, the more important information warfare and security become. Society has been using ICT not only to develop but also to defend itself from internal and external threats (terrorism and war). How is this changing the nature of security and conflicts? What are the ethical issues involved? This chapter deals with these fundamental questions by discussing, among others, topics such as the collection of tactical information, the reliability of vital information and their sources, and the spreading of propaganda or disinformation among the enemy.

Chapter 9 Personal values and computer ethics, Alison Adam

Keywords: community, diversity, gender, personal identity.

ICT, digital environments and virtual communities allow the creation of entirely new scenarios for the construction and re-definition of one's self and for the analysis of gender issues. The cyborg, post-humanist debate has expanded our understanding of the moral questions posed in contexts where individuals have so much more freedom to characterize and shape themselves in a variety of ways. At the same time, social constructions have acquired an entirely new and challenging dimension, thanks to online services such as myspace.com and role games such as *World of Warcraft*. This chapter investigates the new challenges posed by ICT and the consequent ethical debate about personal identity and community, gender issues and diversity.

Chapter 10 Global information and computer ethics, Charles Ess and May Thorseth

Keywords: equal access, digital divide, deliberative democracy, East–West issues, globalization, pluralism.

ICT is often synonymous with globalization. It is not by chance that the information society is identified as a transcultural and transnational phenomenon. This chapter focuses on the global, ethical transformations brought about

by ICT in three contexts. First, the development of a deliberative democracy based on the possibility of a technologically sustainable participation of all members of a community, in a distributed environment (this includes, for example, phenomena such as electronic voting systems and feedback mechanisms and web-based political campaigns). Second, the moral and political problems caused by a technological neo-colonialism coming from the information society and affecting non-ICT-based communities. This topic is related to the digital divide. A person's livelihood and welfare increasingly depend on familiarity with, and ability to use, ICT. How is the information society coping with the new issues posed by *equal access* to ICT systems for people with disabilities, and by the gap between those with regular, effective access to digital technologies and those without? And finally, the debate on pluralism and diversity, that is, whether different cultures (the simplified polarization here is often Eastern vs. Western cultures) might be able to tolerate, if not appreciate, each other in contexts where ICT forces them to interact. A classic example is represented by the different ways in which cultures may assess the importance and value of privacy.

Chapter 11 Computer ethics and applied contexts, John Weckert and Adam Henschke

Keywords: applied ethics, bioethics, business ethics, environmental ethics medical ethics.

ICE, seen as a branch of applied ethics, is really a transdisciplinary field, which touches on several issues also discussed in other areas of applied ethics. ICT plays a key role in bioethics, business ethics, environmental ethics and medical ethics. This chapter investigates these areas of overlapping ethical concerns, to identify the key problems that can be fruitfully approached from an ICE perspective, including biometrics and genetics, the use of computers and computerized control systems in workplaces, environmental issues caused by the IT revolution, and the relation between IT and ethical dilemmas in medical contexts.

Part IV Ethical issues in artificial contexts

This section is dedicated to specific topics and problems, in ICE, characterizing artefacts and synthetic environments. These have been organized into three chapters.

Chapter 12 The ethics of IT artefacts, Vincent Wiegel

Keywords: intentionality, technological artefacts, values.

Researchers in STS (Science and Technology Studies) have long argued that human artefacts, their uses and the practices that they generate, or in which they are embedded, have significant ethical implications. In this chapter, the

value-ladenness of technological artefacts is investigated by extending the STS approach to digital products and tools.

Chapter 13 Artificial life, artificial agents, virtual realities: technologies of autonomous agency, Colin Allen

Keywords: AI, ALife, artificial reality.

ICT has not only modified the reality which we inhabit, it has also created new realities, new agents and new ways of exploring the world of life. These, in turn, have caused old moral issues to be revisited (e.g. responsibility, moral artificial agency) and generated new issues (e.g. action at distance, known as telepresence, virtual crimes). The chapter covers the debates on the ethics of artificial intelligence applications, on the nature of moral life in artificial reality environments, and ethical implications of Alife (artificial life) studies.

Chapter 14 On new technologies, Steve Clarke

Keywords: distributed computing, nano-technology, new emerging technologies.

Nano-technologies and distributed computing (such as RFID tags) promise to blur the boundary between the real (offline) and the virtual (online) by blending the two types of environment into a single 'infosphere'. This radical transformation is already heralding the evolution of new ethical problems, concerning, for example, risk assessment, decisional delegation and heteronomous control. This chapter explores the ethical issues that are arising from these new emerging technologies.

Part V Metaethics

Chapter 15 The foundationalist debate in computer ethics, Herman T. Tavani

Keywords: uniqueness debate, foundation of computer ethics.

As all new disciplines, computer ethics has generated a lively debate on its status as an independent field of philosophical research. Is computer ethics just ethics applied to ICT-related problems? Or does it give rise to a new, independent field of investigation? Is it just another branch of applied ethics, or should it be seen as a version of professional ethics? In this chapter, the debate and the various positions are analysed, in order to provide the reader with clear grasp of the various perspectives from which the main conceptual issues in the field have been approached. It is a difficult and theoretical topic, which advanced students may wish to study only at the end of their course.

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