

10 ethical dilemmas in science and technology

10 Ethical Dilemmas in Science and Technology: Navigating the Moral Maze of Innovation

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Abstract: This article explores ten crucial ethical dilemmas arising from advancements in science and technology. We delve into the complexities of these issues, examining various methodologies and approaches for navigating the moral maze of innovation, including consequentialist, deontological, and virtue ethics frameworks. Understanding these dilemmas is vital for responsible technological development and the creation of a just and equitable future. This exploration of '10 ethical dilemmas in science and technology' is crucial for informed public discourse and responsible policy-making.

1. Artificial Intelligence and Bias: The Algorithmic Pandora's Box

One of the most pressing entries in our list of '10 ethical dilemmas in science and technology' is the pervasive issue of bias in AI. AI systems are trained on data, and if that data reflects existing societal biases (e.g., racial, gender, socioeconomic), the AI will perpetuate and even amplify those biases. This can lead to discriminatory outcomes in areas like loan applications, hiring processes, and even criminal justice. Addressing this requires careful data curation, algorithmic transparency, and ongoing auditing of AI systems for bias. Methodologies for mitigating bias include fairness-aware algorithms, counterfactual analysis, and adversarial training.

2. Genetic Engineering and Designer Babies: Playing God?

The ability to edit the human genome through technologies like CRISPR-Cas9 raises profound ethical questions. While gene editing holds immense promise for treating diseases, its potential use for enhancing human traits ("designer babies") presents a complex ethical dilemma within '10 ethical dilemmas in science and technology'. Concerns include the potential for exacerbating social inequalities, unforeseen health consequences, and the slippery slope towards eugenics. Utilitarian approaches might weigh the potential benefits against risks, while deontological approaches might focus on inherent rights and the sanctity of human life.

3. Autonomous Weapons Systems: The Ethics of Lethal Autonomy

The development of autonomous weapons systems (AWS), also known as lethal autonomous weapons, presents one of the most urgent issues within '10 ethical dilemmas in science and technology'. These are weapons capable of selecting and engaging targets without human intervention. Ethical concerns revolve around accountability, the potential for unintended harm, and the dehumanization of warfare. International discussions are ongoing to establish norms and regulations governing the development and deployment of AWS. A key methodological challenge is determining appropriate levels of human control and oversight.

4. Data Privacy and Surveillance: The Erosion of Individual Liberty?

The proliferation of data collection technologies, from facial recognition to social media tracking, raises significant concerns about privacy and surveillance. The vast amounts of personal data collected are often used for targeted advertising, profiling, and even social control. Balancing the benefits of data-driven innovation with the protection of individual privacy is a central challenge within '10 ethical dilemmas in science and technology'. Methodological approaches include data minimization, anonymization, and the implementation of robust data protection regulations.

5. Nanotechnology and Environmental Risks: The Unseen Consequences

Nanotechnology offers transformative potential in medicine, materials science, and other fields. However, the tiny size of nanoparticles raises concerns about their potential environmental and health impacts. The long-term effects of nanoparticle exposure are largely unknown, posing significant risks. A precautionary principle approach is often advocated, suggesting a need for thorough risk assessment and careful regulation before widespread deployment.

6. Climate Change and Technological Solutions: A Moral Imperative?

Climate change presents a profound ethical dilemma. The disproportionate impact on vulnerable populations and the long-term consequences for future generations demand urgent action. Technological

solutions, such as carbon capture and geoengineering, offer potential but also raise ethical questions about unintended consequences, equitable access to solutions, and the potential for technological hubris.

7. Artificial Intelligence and Job Displacement: The Economic and Social Fallout

The increasing automation of tasks through AI raises concerns about widespread job displacement. While AI can boost productivity, it also poses a significant threat to employment across various sectors. Addressing this requires proactive policies to support workforce retraining, social safety nets, and a broader societal discussion about the future of work. Ethical frameworks need to consider distributive justice and the equitable distribution of benefits from technological advancements.

8. Gene Drives and Ecosystem Manipulation: Unintended Ecological Consequences

Gene drives are technologies that can rapidly spread modified genes through a population. While offering potential solutions for controlling invasive species and disease vectors, they also raise serious concerns about unintended ecological consequences and the potential for irreversible alterations to ecosystems. Careful risk assessment and robust regulatory frameworks are crucial.

9. Access to Technology and Global Inequality: The Digital Divide

The unequal distribution of access to technology exacerbates existing global inequalities. The "digital divide" creates disparities in education, healthcare, and economic opportunities. Addressing this requires international cooperation to ensure equitable access to technology and digital literacy training. Ethical frameworks must consider principles of global justice and the right to technological participation.

10. Bioprinting and Organ Transplantation: Ethical Considerations of Artificial Organs

The development of bioprinting technologies allows for the creation of artificial organs, offering a potential solution to organ shortages. However, this also raises questions about the ethical sourcing of cells, the potential for commercial exploitation, and equitable access to this life-saving technology. Methodologies for ethical organ bioprinting must address issues of informed consent, equitable distribution, and the potential for misuse.

Conclusion:

These '10 ethical dilemmas in science and technology' highlight the complex and interwoven challenges posed by rapid technological advancement. Navigating these dilemmas requires a multi-faceted approach, drawing upon various ethical frameworks, incorporating public participation, and establishing robust regulatory mechanisms. Only through careful consideration of ethical implications can we ensure that scientific and technological progress serves humanity and creates a more just and sustainable future.

FAQs:

1. What is consequentialism, and how does it apply to these dilemmas? Consequentialism judges the morality of an action based on its consequences. In these dilemmas, it would involve weighing the potential benefits against the potential harms.
1. What is deontology, and how does it apply to these dilemmas? Deontology emphasizes moral duties and rules, regardless of consequences. In these dilemmas, it might focus on inherent rights, autonomy, or the sanctity of life.
1. How can we ensure fairness and equity in AI development? By addressing bias in training data, promoting algorithmic transparency, and implementing robust auditing processes.
1. What are the potential long-term consequences of gene editing? Unknown health risks, exacerbation of social inequalities, and potential misuse for enhancement purposes.
1. How can we regulate autonomous weapons effectively? Through international treaties and agreements that establish clear norms and oversight mechanisms.
1. How can we protect data privacy in an increasingly data-driven world? Through strong data protection regulations, data minimization, and anonymization techniques.

1. What are the potential economic and social impacts of AI-driven automation? Widespread job displacement and increased economic inequality if not managed proactively.
1. What is the precautionary principle, and why is it relevant to nanotechnology? It suggests erring on the side of caution when dealing with potential risks, especially when the long-term effects are unknown.
1. How can we ensure equitable access to life-saving technologies? Through international cooperation, affordable pricing strategies, and equitable distribution mechanisms.

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1. "Global Health Equity and Access to Technology": An analysis of the challenges in ensuring equitable access to healthcare technologies and resources in a globalized world.

10 ethical dilemmas in science and technology: Science and Technology Governance and Ethics Miltos Ladikas, Sachin Chaturvedi, Yandong Zhao, Dirk Stemerding, 2015-01-26 This book analyzes the possibilities for effective global governance of science in Europe, India and China. Authors from the three regions join forces to explore how ethical concerns over new technologies can be incorporated into global science and technology policies. The first chapter introduces the topic, offering a global perspective on embedding ethics in science and technology policy. Chapter Two compares the institutionalization of ethical debates in science, technology and innovation policy in three important regions: Europe, India and China. The third chapter explores public perceptions of science and technology in these same three regions. Chapter Four discusses public engagement in the governance of science and technology, and Chapter Five reviews science and technology governance and European values. The sixth chapter describes and analyzes values demonstrated in the constitution of the People's Republic of China. Chapter Seven describes emerging evidence from India on the uses of science and technology for socio-economic development, and the quest for inclusive growth. In Chapter Eight, the authors propose a comparative framework for studying global ethics in science and technology. The following three chapters offer case studies and analysis of three emerging industries in India, China and Europe: new food technologies, nanotechnology and synthetic biology. Chapter 12 gathers all these threads for a comprehensive discussion on

incorporating ethics into science and technology policy. The analysis is undertaken against the backdrop of different value systems and varying levels of public perception of risks and benefits. The book introduces a common analytical framework for the comparative discussion of ethics at the international level. The authors offer policy recommendations for effective collaboration among the three regions, to promote responsible governance in science and technology and a common analytical perspective in ethics.

10 ethical dilemmas in science and technology: Global Issues and Ethical

Considerations in Human Enhancement Technologies Thompson, Steven John, 2014-04-30

With rapid advancements in human enhancement technologies, society struggles with many issues, such as definition, effects, participation, regulation, and control. Current and future initiatives in these technologies may not be in the participants' best interests; therefore, it is imperative for research on humanitarian considerations to be available to those affiliated with this field. *Global Issues and Ethical Considerations in Human Enhancement Technologies* compiles prestigious research and provides a well-rounded composite of the field's role in emerging technologies. Addressing both present and future concerns, this publication serves as a valuable reference work for researchers, students, professionals, and practitioners involved in computer science and the humanities, as well as many engaged in a humanities approach to metasystems, new artificial life, and robotics.

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Age of Technology: Theories and Practice Luppicipini, Rocci, 2013-02-28 Our social, educational, professional, and political ethics play a significant role in every aspect of our life. As technology continues to influence our society, these principles need to be valued. *Moral, Ethical, and Social Dilemmas in the Age of Technology: Theories and Practice* highlights the innovations and developments in the ethical features of technology in society. This comprehensive collection brings together research in the areas of computer, engineering, and biotechnical ethics. These theoretical studies and innovative methodologies are essential for researchers, practitioners and philosophers.

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Knowledge Society: Ethical Issues in Technological Design, Research, Development, and

Innovation Luppicipini, Rocci, 2010-01-31 This book introduces the reader to the key concepts and issues that comprise the emerging field of Technoethics, the interdisciplinary field concerned with all ethical aspects of technology within a society shaped by technology--Provided by publisher.

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Advancements and Applications in Society Luppicipini, Rocci, 2012-06-30 This book explores the ethical challenges of technology innovations, providing cutting-edge analysis of designs, developments, impacts, policies, theories, and methodologies related to ethical aspects of technology in society--Provided by publisher.

10 ethical dilemmas in science and technology: Ethics in Computing, Science, and

Engineering Barry G. Blundell, 2020-02-05 This comprehensive textbook introduces students to the wide-ranging responsibilities of computing, science and engineering professionals by laying strong transdisciplinary foundations and by highlighting ethical issues that may arise during their careers. The work is well illustrated, and makes extensive use of both activities, and ethical dilemmas which are designed to stimulate reader engagement. A number of memorable case studies are also included and frequently draw on the demanding aerospace industry. The book adopts a strongly human centric approach, with matters such as privacy erosion and censorship being viewed not only in their current context but also in terms of their ongoing evolution. What are our individual ethical responsibilities for ensuring that we do not develop for future generations a technological leviathan with the potential to create a dystopian world? A broad range of technologies and techniques are introduced and are examined within an ethical framework. These include biometrics, surveillance systems (including facial recognition), radio frequency identification devices, drone technologies, the Internet of Things, and robotic systems. The application and potential societal ramifications of such systems are examined in some detail and this is intended to support the reader in gaining a clear

insight into our current direction of travel. Importantly, the author asks whether we can afford to allow ongoing developments to be primarily driven by market forces, or whether a more cautious approach is needed. Further chapters examine the benefits that are associated with ethical leadership, environmental issues relating to the technology product lifecycle (from inception to e-waste), ethical considerations in research (including medical experimentation involving both humans and animals), and the need to develop educational programs which will better prepare students for the needs of a much more fluid employment landscape. The final chapter introduces a structured approach to ethical issue resolution, providing a valuable, long-term source of reference. In addition it emphasises the ethical responsibilities of the professional, and considers issues that can arise when we endeavour to effect ethically sound change within organisations. Examples are provided which highlight the possible ramifications of exercising ethical valour. The author has thus created an extensively referenced textbook that catalyses student interest, is internationally relevant, and which is multicultural in both its scope and outlook.

10 ethical dilemmas in science and technology: Ethical and Social Issues in the Information Age Joseph M. Kizza, 2007-06-02 This textbook provides an introduction to the social and policy issues which have arisen as a result of information technology. Whilst it assumes a modest familiarity with computers, its aim is to provide a guide to the issues suitable for undergraduates. In doing so, the author prompts the students to consider questions such as: What are the moral codes of cyberspace? Throughout, the book shows how in many ways the technological development is outpacing the ability of our legal systems to keep up, and how different paradigms applied to ethical questions may often offer conflicting conclusions. As a result students will find this to be a thought-provoking and valuable survey.

10 ethical dilemmas in science and technology: Ethics Of Chemistry: From Poison Gas To Climate Engineering Joachim Schummer, Tom Borsen, 2021-02-08 'Overall, this collection of case studies provides an outstanding starting point for understanding the ethics of chemistry. It is an extremely important contribution to the study of chemical ethics ... Ethics of Chemistry is a key resource for educators interested in integrating ethics instruction into their chemistry curricula ... an important foundation for equipping students with the moral judgement and analytical skills necessary to contend with the ethical issues they are likely to face in their professional lives.' 'Nature Chemistry' ... the book offers a general introduction to many relevant topics concerning the values, responsibilities, and judgements in (and of) chemistry. The volume could be helpful for university students and teachers or even general readers interested in the ethics of chemistry.' [Read Full Review] José Ramón Bertomeu-Sánchez Although chemistry has been the target of numerous public moral debates for over a century, there is still no academic field of ethics of chemistry to develop an ethically balanced view of the discipline. And while ethics courses are increasingly demanded for science and engineering students in many countries, chemistry is still lagging behind because of a lack of appropriate teaching material. This volume fills both gaps by establishing the scope of ethics of chemistry and providing a case-based approach to teaching, thereby also narrating a cultural history of chemistry. From poison gas in WWI to climate engineering of the future, this volume covers the most important historical cases of chemistry. It draws lesson from major disasters of the past, such as in Bhopal and Love Canal, or from thalidomide, Agent Orange, and DDT. It further introduces to ethical arguments pro and con by discussing issues about bisphenol-A, polyvinyl chloride, and rare earth elements; as well as of contested chemical projects such as human enhancement, the creation of artificial life, and patents on human DNA. Moreover, it illustrates chemical engagements in preventing hazards, from the prediction of ozone depletion, to Green Chemistry, and research in recycling, industrial substance substitution, and clean-up. Students also learn about codes of conduct and chemical regulations. An international team of experts narrate the historical cases and analyse their ethical dimensions. All cases are suitable for undergraduate teaching, either in classes of ethics, history of chemistry, or in chemistry classes proper.

10 ethical dilemmas in science and technology: BioIndustry Ethics David L. Finegold, Cecile

M Bensimon, Abdallah S. Daar, Margaret L. Eaton, Beatrice Godard, Bartha Maria Knoppers, Jocelyn Mackie, Peter A. Singer, 2005-07-19 This book is the first systematic, detailed treatment of the approaches to ethical issues taken by biotech and pharmaceutical companies. The application of genetic/genomic technologies raises a whole spectrum of ethical questions affecting global health that must be addressed. Topics covered in this comprehensive survey include considerations for bioprospecting in transgenics, genomics, drug discovery, and nutrigenomics, as well as how to improve stakeholder relations, design ethical clinical trials, avoid conflicts of interest, and establish ethics advisory boards. The expert authors represent multiple disciplines including law, medicine, bioinformatics, pharmaceuticals, business, and ethics.

10 ethical dilemmas in science and technology: Applied Ethics in a Digital World

Vasiliu-Feltes, Ingrid, Thomason, Jane, 2021-11-19 As advances in disruptive technologies transform politics and increase the velocity of information and policy flows worldwide, the public is being confronted with changes that move faster than they can comprehend. There is an urgent need to analyze and communicate the ethical issues of these advancements. In a perpetually updating digital world, data is becoming the dominant basis for reality. This new world demands a new approach because traditional methods are not fit for a non-physical space like the internet. *Applied Ethics in a Digital World* provides an analysis of the ethical questions raised by modern science, technological advancements, and the fourth industrial revolution and explores how to harness the speed, accuracy, and power of emerging technologies in policy research and public engagement to help leaders, policymakers, and the public understand the impact that these technologies will have on economies, legal and political systems, and the way of life. Covering topics such as artificial intelligence (AI) ethics, digital equity, and translational ethics, this book is a dynamic resource for policymakers, civil society, CEOs, ethicists, technologists, security advisors, sociologists, cyber behavior specialists, criminologists, data scientists, global governments, students, researchers, professors, academicians, and professionals.

10 ethical dilemmas in science and technology: Artificial Intelligence for a Better Future Bernd Carsten Stahl, 2021-03-17 This open access book proposes a novel approach to Artificial Intelligence (AI) ethics. AI offers many advantages: better and faster medical diagnoses, improved business processes and efficiency, and the automation of boring work. But undesirable and ethically problematic consequences are possible too: biases and discrimination, breaches of privacy and security, and societal distortions such as unemployment, economic exploitation and weakened democratic processes. There is even a prospect, ultimately, of super-intelligent machines replacing humans. The key question, then, is: how can we benefit from AI while addressing its ethical problems? This book presents an innovative answer to the question by presenting a different perspective on AI and its ethical consequences. Instead of looking at individual AI techniques, applications or ethical issues, we can understand AI as a system of ecosystems, consisting of numerous interdependent technologies, applications and stakeholders. Developing this idea, the book explores how AI ecosystems can be shaped to foster human flourishing. Drawing on rich empirical insights and detailed conceptual analysis, it suggests practical measures to ensure that AI is used to make the world a better place.

10 ethical dilemmas in science and technology: *The Evolving Landscape of Ethical Digital Technology* Simon Rogerson, 2021-09-16 In a world that is awash in ubiquitous technology, even the least tech-savvy know that we must take care how that technology affects individuals and society. That governments and organizations around the world now focus on these issues, that universities and research institutes in many different languages dedicate significant resources to study the issues, and that international professional organizations have adopted standards and directed resources toward ethical issues in technology is in no small part the result of the work of Simon Rogerson. – Chuck Huff, Professor of Social Psychology at Saint Olaf College, Northfield, Minnesota In 1995, Apple launched its first WWW server, Quick Time On-line. It was the year Microsoft released Internet Explorer and sold 7 million copies of Windows 95 in just 2 months. In March 1995, the author Simon Rogerson opened the first ETHICOMP conference with these words: We live in a

turbulent society where there is social, political, economic and technological turbulence ... it is causing a vast amount of restructuring within all these organisations which impacts on individuals, which impacts on the way departments are set up, organisational hierarchies, job content, span of control, social interaction and so on and so forth. ... Information is very much the fuel of modern technological change. Almost anything now can be represented by the technology and transported to somewhere else. It's a situation where the more information a computer can process, the more of the world it can actually turn into information. That may well be very exciting, but it is also very concerning. That could be describing today. More than 25 years later, these issues are still at the forefront of how ethical digital technology can be developed and utilised. This book is an anthology of the author's work over the past 25 years of pioneering research in digital ethics. It is structured into five themes: Journey, Process, Product, Future and Education. Each theme commences with an introductory explanation of the papers, their relevance and their interrelationship. The anthology finishes with a concluding chapter which summarises the key messages and suggests what might happen in the future. Included in this chapter are insights from some younger leading academics who are part of the community charged with ensuring that ethical digital technology is realised.

10 ethical dilemmas in science and technology: An Ethics of Science Communication

Fabien Medvecky, Joan Leach, 2019-11-01 This book presents the first comprehensive set of principles for an ethics of science communication. We all want to communicate science ethically, but how do we do so? What does being ethical when communicating science even mean? The authors argue that ethical reasoning is essential training for science communicators. The book provides an overview of the relationship between values, science, and communication. Ethical problems are examined to consider how to create an ethics of science communication. These issues range from the timing of communication, narratives, accuracy and persuasion, to funding and the client-public tension. The book offers a tailor-made ethics of science communication based on principlism. Case studies are used to demonstrate how this tailor-made ethics can be applied in practice.

10 ethical dilemmas in science and technology: Where Science and Ethics Meet

Chris Willmott, Salvador Macip, 2016-06-13 Designer babies: choosing our children -- Haven't I seen you before? -- Exchange parts for everybody -- How to improve yourself -- Who wants to live forever? -- Big brother is watching your genome -- Something on your mind? -- Playing God -- Trust me, I'm a scientist!

10 ethical dilemmas in science and technology: Innovation in Medical Technology

Margaret L. Eaton, Donald Kennedy, 2007-02-28 This thought-provoking study examines the ethical, legal, and social problems that arise with cutting-edge medical technology. Using as examples four powerful and largely unregulated technologies—off-label use of drugs, innovative surgery, assisted reproduction, and neuroimaging—Margaret L. Eaton and Donald Kennedy illustrate the difficult challenges faced by clinicians, researchers, and policy makers who seek to advance the frontiers of medicine safely and responsibly. Supported by medical history and case studies and drawing on reports from dozens of experts, the authors address important practical, ethical, and policy issues. They consider topics such as the responsible introduction of new medical products and services, the importance of patient consent, the extent of the duty to mitigate harm, and the responsibility to facilitate access to new medical therapies. This work's insights into the nature and consequences of medical innovation contribute to the national debate on how best to protect patients while fostering innovation and securing benefits.

10 ethical dilemmas in science and technology: An Examination of Emerging Bioethical

Issues in Biomedical Research National Academies of Sciences, Engineering, and Medicine, Health and Medicine Division, Board on Health Sciences Policy, 2020-09-10 On February 26, 2020, the Board on Health Sciences Policy of the National Academies of Sciences, Engineering, and Medicine hosted a 1-day public workshop in Washington, DC, to examine current and emerging bioethical issues that might arise in the context of biomedical research and to consider research topics in bioethics that could benefit from further attention. The scope of bioethical issues in research is broad, but this workshop focused on issues related to the development and use of digital

technologies, artificial intelligence, and machine learning in research and clinical practice; issues emerging as nontraditional approaches to health research become more widespread; the role of bioethics in addressing racial and structural inequalities in health; and enhancing the capacity and diversity of the bioethics workforce. This publication summarizes the presentations and discussions from the workshop.

10 ethical dilemmas in science and technology: Ethics of Emerging Technologies

Thomas F. Budinger, Miriam D. Budinger, 2006-04-07 An insightful guide to understanding and navigating the ethical issues faced by anyone affected by the ethical dilemmas associated with current and emerging technologies Ethics of Emerging Technologies provides the background, insight, and tools for approaching and solving ethical dilemmas across a broad range of topics. The text discusses ethical problems, using examples and reasoning tools that will aid engineers, scientists, managers, administrators, and the public who wish to understand risks, benefits, and possible approaches to resolving conflicts associated with new technologies in the context of the global community. Solutions we choose to ethical dilemmas accompanying new technologies will profoundly affect future generations. Scientific facts and guides to decision-making for all associated with emerging technologies are presented. Some of the topics are: Human health and environmental effects of alternative energy production methods Communications and privacy Plagiarism and authorship Genetic modification of organisms Human and animal experimentation Synthetic biology and bioterrorism Confidentiality in science, engineering, and business communications Risks and consequences of enhancing human beings through new technologies Cloning of human beings and stem cell research Brain modifications Space exploration

10 ethical dilemmas in science and technology: Ethical Issues in Information Systems

Roy Dejoie, George C. Fowler, David B. Paradise, 1991 This book explores the impact of technology on ethical issues. A series of real-world scenarios are drawn from both business- and technology-oriented contexts.

10 ethical dilemmas in science and technology: Ethical Technology Use, Policy, and Reactions in Educational Settings Beycioglu, Kadir, 2012-07-31 As computers are increasingly integrated into the classroom, instructors must address a number of pressing ethical questions regarding online behavior, course design, cyberbullying, and student cyber behavior. Ethical Technology Use, Policy, and Reactions in Educational Settings provides state-of-the-art research on the impact of ethical computer use in academia and emphasizes the cyberphilosophical aspects of human-computer interactions. It provides significant analysis of the ethical use of educational Internet and computer applications.

10 ethical dilemmas in science and technology: The Lives to Come Philip Kitcher, 1997-08-04 ect, Philip Kitcher takes readers into the heart of the revolution in genetic research today and raises important philosophical questions about its impact on ethical, legal, and political issues, now and in the future.

10 ethical dilemmas in science and technology: The Fourth Industrial Revolution Klaus Schwab, 2017-01-03 The founder and executive chairman of the World Economic Forum on how the impending technological revolution will change our lives We are on the brink of the Fourth Industrial Revolution. And this one will be unlike any other in human history. Characterized by new technologies fusing the physical, digital and biological worlds, the Fourth Industrial Revolution will impact all disciplines, economies and industries - and it will do so at an unprecedented rate. World Economic Forum data predicts that by 2025 we will see: commercial use of nanomaterials 200 times stronger than steel and a million times thinner than human hair; the first transplant of a 3D-printed liver; 10% of all cars on US roads being driverless; and much more besides. In The Fourth Industrial Revolution, Schwab outlines the key technologies driving this revolution, discusses the major impacts on governments, businesses, civil society and individuals, and offers bold ideas for what can be done to shape a better future for all.

10 ethical dilemmas in science and technology: Ethics of Information and Communication Technologies Adriano Fabris, 2018-03-12 This book discusses key ethical and

deontological problems concerning the use of the most common information and communication devices. It focuses on the challenges of the new environments we now find ourselves in thanks to these technologies, and the issues arising from the newly established relationship between the virtual sphere and the real world. Each aspect is analysed by starting from a very specific example or a case study presenting a dilemma that can only be resolved by making a reasoned ethical choice. Rather than thematically addressing only one of the many aspects mentioned above (for example, computer ethics or social network ethics), the book presents a comprehensive introduction to, and a co-ordinated overview of, the various deontological and ethical issues regarding the spread of the most common information and communication technologies.

10 ethical dilemmas in science and technology: On the Dual Uses of Science and Ethics

Michael J. Selgelid, Brian Rappert, 2013-12-19 Claims about the transformations enabled by modern science and medicine have been accompanied by an unsettling question in recent years: might the knowledge being produced undermine – rather than further – human and animal well being? On the Dual Uses of Science and Ethics examines the potential for the skills, know-how, information, and techniques associated with modern biology to serve contrasting ends. In recognition of the moral ambiguity of science and technology, each chapter considers steps that might be undertaken to prevent the deliberate spread of disease. Central to achieving this aim is the consideration of what role ethics might serve. To date, the ethical analysis of the themes of this volume has been limited. This book remedies this situation by bringing together contributors from a broad range of backgrounds to address a highly important ethical issue confronting humanity during the 21st century.

10 ethical dilemmas in science and technology: Artificial Intelligence in Healthcare

Adam Bohr, Kaveh Memarzadeh, 2020-06-21 Artificial Intelligence (AI) in Healthcare is more than a comprehensive introduction to artificial intelligence as a tool in the generation and analysis of healthcare data. The book is split into two sections where the first section describes the current healthcare challenges and the rise of AI in this arena. The ten following chapters are written by specialists in each area, covering the whole healthcare ecosystem. First, the AI applications in drug design and drug development are presented followed by its applications in the field of cancer diagnostics, treatment and medical imaging. Subsequently, the application of AI in medical devices and surgery are covered as well as remote patient monitoring. Finally, the book dives into the topics of security, privacy, information sharing, health insurances and legal aspects of AI in healthcare. - Highlights different data techniques in healthcare data analysis, including machine learning and data mining - Illustrates different applications and challenges across the design, implementation and management of intelligent systems and healthcare data networks - Includes applications and case studies across all areas of AI in healthcare data

10 ethical dilemmas in science and technology: Radical Solutions and Open Science

Daniel Burgos, 2020-05-14 This open access book presents how Open Science is a powerful tool to boost Higher Education. The book introduces the reader into Open Access, Open Technology, Open Data, Open Research results, Open Licensing, Open Accreditation, Open Certification, Open Policy and, of course, Open Educational Resources. It brings all these key topics from major players in the field; experts that present the current state of the art and the forthcoming steps towards a useful and effective implementation. This book presents radical, transgenic solutions for recurrent and long-standing problems in Higher Education. Every chapter presents a clear view and a related solution to make Higher Education progress and implement tools and strategies to improve the user's performance and learning experience. This book is part of a trilogy with companion volumes on Radical Solutions & Learning Analytics and Radical Solutions & eLearning.

10 ethical dilemmas in science and technology: Handbook of Research on Technoethics

Luppardini, Rocci, Adell, Rebecca, 2008-08-31 This book traces the emergence of the new interdisciplinary field of technoethics by exploring its conceptual development, important issues, and key areas of current research. Compiling 50 authoritative articles from leading researchers on the ethical dimensions of new technologies--Provided by publisher.

10 ethical dilemmas in science and technology: Science and Babies Institute of Medicine, Suzanne Wymelenberg, 1990-02-01 By all indicators, the reproductive health of Americans has been deteriorating since 1980. Our nation is troubled by rates of teen pregnancies and newborn deaths that are worse than almost all others in the Western world. Science and Babies is a straightforward presentation of the major reproductive issues we face that suggests answers for the public. The book discusses how the clash of opinions on sex and family planning prevents us from making a national commitment to reproductive health; why people in the United States have fewer contraceptive choices than those in many other countries; what we need to do to improve social and medical services for teens and people living in poverty; how couples should shop for a fertility service and make consumer-wise decisions; and what we can expect in the future—featuring interesting accounts of potential scientific advances.

10 ethical dilemmas in science and technology: Ethical Issues and Social Dilemmas in Knowledge Management: Organizational Innovation Morais da Costa, Goncalo Jorge, 2010-09-30 This book considers ethical issues and social dilemmas at two levels: the individual vs. individual and the individual vs. the collective, providing a thorough treatment of these facets and demonstrating the philosophical underpinnings of each dimension of knowledge management--Provided by publisher.

10 ethical dilemmas in science and technology: Computer Ethics Tom Forester, Perry Morrison, 1994 Widely acclaimed for its readability and its balanced and authoritative coverage, Computer Ethics has been thoroughly revised and updated with new anecdotes, new revelations, and lively discussion of the ethical, social, and professional issues arising from the computer revolution, such as computer crime, software theft, hacking, viruses, and the invasion of privacy.

10 ethical dilemmas in science and technology: Case Studies in Information and Computer Ethics Richard A. Spinello, 1997 Addressing salient ethical issues of the information age, this study offers a broad collection of case studies on information and computer ethics. The work addresses issues involved in the acquisition, access and stewardship of information resources

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