BOOK REVIEW

Next-Generation Ethics: Engineering a Better Society edited by Ali E. Abbas (2019) Cambridge University Press, Cambridge, 474pp., paperback £30, ISBN: 9781108727372

Next Generation Ethics: Engineering a Better Society is an anthology featuring short chapters on the ethics of engineering, business and technology, intended for a broad audience. The 35 men and eight women who contribute to the volume are mostly ethicists, engineers, lawyers or policy specialists based at universities or technology companies. In terms of topics, the book is heavy on artificial intelligence (AI), data and digital technology, but such topics as management fads, the construction industry and the oil and gas industry are featured too. This is by no means just a review of the ethics of engineering, but also an overview of ethical concerns in engineering practice. It is a broad and comprehensive learning and teaching book to use and discuss rather than a research book to cite.

Abbas is professor of industrial and systems engineering and public policy at the University of Southern California at the Sol Price School of Public Policy. He makes clear that the purpose of the book is to explore from various professional perspectives the ethical issues regarding many 'significant features of our era' (p.1). Examples are the design of large-scale systems, social media, artificial intelligence and online transactions. The motivation for compiling the book is to make the ethical sensitivities around technology understandable to a broad spectrum of stakeholders – citizens, engineers, policymakers and business organizations.

Chapter 2 introduces a number of distinctions in ethics: prudence, legality and ethics of actions, lying, stealing or harming and positive and negative ethical commitments. The first chapter of Part I explores the question: what kind of ethical code is needed for Internet of Things technologies? The authors recommend a mixture of deontological, teleological and virtue approaches in dealing with this and other emerging technologies. The next chapter outlines some opportunities and problems of immersive technologies, such as the creation of lifelike digital copies of humans. The author identifies three ethical considerations for immersive technologies: deception, emotional manipulation and violation of privacy. Another chapter presents a Hippocratic oath for technologists and another features an ethics and future-themed interview with one of the creators of the internet, Vint Cerf, which includes his musings on the ethics of CRISPR (clustered regularly interspaced short palindromic repeats) and whether there is life on other planets. The following chapter outlines issues pertaining to privacy and the greater good, discussing algorithms for predicting depression from tweets as well as the public outrage produced by and the legal responses to similar technologies. The last chapter presents some considerations for implementing AI containers, or technological barriers to AI becoming a threat to humans.

Part II, on business enterprises, contains chapters on the management of ethical behaviour in organizations. The first of these gives a brief history of business ethics, seeing big data and algorithms as a 'coming challenge' for business ethics. The second deals with privacy issues that can arise in the digital systems businesses use for internal and supply chain monitoring. The third argues that management fads and badly designed targets – 'big, hairy, audacious goals' (p.145) – can easily push employees into unethical behaviour. It recommends a focus on outcomes (such as incentivizing good behaviour) rather than output (such as number of new clients). Another chapter explores the rise of remote and temporary teams and how this affects such values as loyalty in teamwork. The chapter recommends rating systems of employees or a less Orwellian instrument – gossip. A chapter on the need for transparency in organizations features many cautionary tales from companies that lacked transparency. The last chapter recommends that leaders build a culture in which employees feel it their duty to report misconduct. Leaders should also make themselves accountable for the decisions they make.

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Part III is focused mostly on the ethical responsibilities of engineers. The first chapter analyses the Volkswagen diesel-cheating scandal and concludes that the organization was not well prepared to deal with such misconduct. A subsequent chapter talks about bribery, bid-rigging and money laundering, which happen a lot in the building industry. A further chapter, written by an engineer, is on ethical issues in the oil and gas industry and recommends digital tools for increased safety. The next chapter examines the legal aspects of whistleblowing and resisting misconduct, and the need for legal protection for individuals who do so. An anonymous contact of the author at NASA provides examples of 'bad engineering', by which is meant failure to take certain precautions, failing to acknowledge risks by seeing them as outside one's responsibilities and underestimating the likelihood of unwanted events. The final chapter is on using tools, such as life-cycle assessment, to reveal moral dilemmas in various product choices. This point is illustrated with a case study where an anaesthetic that is the healthiest for an individual patient is more damaging to public health or the environment if its manufacture is taken into account.

Part IV looks at legal and regulatory issues. One chapter compares the perspectives of four university deans on ethics at the university, another the role of law and ethical standards in technological innovations and a third puts forward some principles for avoiding morally uncomfortable situations as an attorney. In a vague way, the author connects these principles to evolutionary ethics. A chapter on moral principles for the medical practice discusses ethical aspects of recent medical technologies, another addresses the need for ethical analysis as part of the life-cycle management of medical products used by doctors, arguing that regulations and codes of conduct are insufficient. A chapter on the changing role of journalists as gatekeepers of the news highlights the ethical issues of fake news and live-streaming that exposes viewers to real and sometimes traumatizing sights. A subsequent chapter on social media connects the rise of social media to growing mistrust in news and media, highlighting that mistrust in such media sites as Facebook is justified. A super-short piece on AI is followed by discussion on cyberspace and its impact on free speech, intellectual property rights, privacy, security and power balance between companies and the government. The book ends with an inspiring piece by a 'dean of religious life' at a university describing a rising interfaith mentality in the US with touching examples of interfaith student initiatives at his university.

Abbas has approached the compilation of this book as an engineer and policy scholar rather than a philosopher. The concrete issues faced by professionals are at the heart of the collection. The inclusion of different perspectives invites readers to reflect on their own perspectives and the inclusion of concepts from fields outside ethics shows an interdisciplinary spirit. This volume would make a good resource for an undergraduate course or a series of professional workshops at the intersection of ethics and technology. The book covers a broad range of topics in many different styles, based on different sources and written at different levels of difficulty. Many chapters make a claim; some are textbook-style explanations of concepts. Some are heavily based on research, others on the personal experience of engineers. There is one transcript of an interview as well as a transcript of a panel with university deans. The contributions of engineers and other professionals also provide an insight into disciplinary differences in perceptions of ethical problems.

However, my greatest challenge to this book would be the same challenge I pose my students, young engineers who take my ethics course. Often they ask themselves how they might implement technology x, as ethically as possible, given the ethical limitations of x. I ask them: 'If technology x has these ethical limitations, should you even implement it?' We can be so entranced by the notion that technology must progress that we do not ask why. I believe it is the responsibility of an engineer also to ask whether we really should want 'progress'. For example, a chapter on ethical issues in the oil and gas industry is written by Iraj Ershagi, professor and director of the petroleum engineering program at University of Southern California. The chapter goes into great detail on safety hazards at oil fields and how digital technologies can help make oil field work more safe and, hence, more ethical. The author mentions the regrettable environmental impacts of oil usage, but dismisses them because 'getting there will be expensive and require sacrifices'. We should be 'reducing the environmental impact of oil and gas consumption while other efforts or

alternatives are underway'. This sounds rather like the alternatives underway are someone else's responsibility! Shouldn't eliminating the oil and gas industry be the number one goal and responsibility of every oil and gas engineer? I was surprised that the author did not engage with the global problems caused by the oil and gas industry and the role and responsibility of engineers in combatting these problems. I teach my students that an engineer should engage with the global and ethical questions of their job, rather than relying on the state to ban whatever is unethical and allow whatever is not. The solutions the author presents are focused almost completely on safety. This focus seems quite narrow given that the author also mentions such issues as the 'shady practices' (p.250) around oil reserve estimation and workplace racism at unmonitored and remote oil fields. Nevertheless, the chapter does provide a glimpse into the issues surrounding this industry and perhaps also how professionals in the field are inclined to reason.

Other chapters also take the route of bending social practices to fit new technologies rather than reflecting on whether the technology or new practice is worth keeping. Aric Horvitz and Deirdre Mulligan discuss data mining and privacy. The use of personal data by companies creates privacy concerns and the authors recommend more transparency for customers and legal constraints on data use. What about just ending this type of business model? What about making it illegal and shutting it all down? The questions remain unasked.

'How next-generation teams and teaming may affect the ethics of working in teams' by Scott Wiltermuth and Alyssa Han, is another example. The chapter outlines some potential issues arising from remote teamwork. Rather than questioning the new direction teamwork has taken, the chapter recommends gossip and rating systems for increasing loyalty at work. While the authors provide a perfectly reasonable conclusion, more critical questions are left unasked. What about just going back to long-term, personal teamwork? Is the lack of loyalty arising from these new practices not a reason to organize more local and long-term workplaces?

Of course, it is not entirely fair to judge a book by what it does not do. But the reader should be aware that this is not a book that challenges the *status quo*, although this is not the case with all chapters. Marianne Jennings, for instance, is very critical of management fads and recommends throwing them out of the window. But this is the exception; most chapters are not critical of new practices. Most of the book is focused on prescribing ethical conduct on the assumption that the *status quo* will be maintained. Whether this is uncritical or admirably pragmatic depends on perspective, but if this is 'next generation ethics', the next generation does not consist of revolutionaries.

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