

**Book Review: *Emerging Pervasive Information and
Communication Technologies (PICT)****

By Thomas M. Powers**

* Edited by Kenneth D. Pimple, Springer, 2014, 252 pages

** Associate Professor of Philosophy and Director, Center for Science, Ethics & Public Policy,
University of Delaware, tpowers@udel.edu

Emerging Pervasive Information and Communication Technologies (PICT) is a highly interdisciplinary collection of eleven essays from an NSF-sponsored workshop on “Pervasive and Autonomous Information Technology.”¹ Editor Kenneth D. Pimple has arranged the essays so that the inquiry starts with cases and applications (concerning GPS, automated stock trading, healthcare information systems, surveillance, and the like) and closes with two decidedly more abstract or theoretical discussions of moral rules and principles, written by Pimple and Keith Miller, respectively.

For the reader, this arrangement provides plenty of actual or near-term scenarios and applications of pervasive (some would say ‘ubiquitous’) information and communication technology (PICT), before the moral rules and principles that could be applied to them are directly considered. But make no mistake about it: the consideration of normative issues is abundant in the earlier chapters, and this is a real strength of the book. The less philosophically-inclined reader could easily benefit from the consideration of the applications, and yet reject the later theoretical analyses. Likewise, the two concluding theoretical essays could stand alone as contributions to the ethics of IT. But the essays as a group are best read as an arranged narrative—one that considers the ethical dimensions of technologies, takes account of points of intersection through the book, and then elicits the rules and principles to address these dimensions.

Pimple’s introductory first chapter gives a brief overview of each subsequent essay, and is a useful guide for the reader who may want to skim or skip around based on particular interests. In the introduction, he describes the uniting framework for the ethical inquiries to come as one of “anticipatory ethics”—which contains an expectation that work in ethics can influence emerging technologies and the socio-technical systems in which they are embedded. This is a laudable goal, but one wonders immediately if a family of technologies that is both emerging and pervasive—and overwhelmingly favored by world trends in global trade, consumerism, and the rhetoric of efficiency—can really be altered, significantly, by scholarship on ethics. In essence, the problem is that, by the

time we (scholars) know enough about PICT to worry intelligently about them, it is too late to anticipate and influence their trajectories. The technological horse has left the gate.

But what are we to do—leave the ethics up to the designers and engineers? It is fair to assume that the authors of this volume reject that notion, and believe that technologies that are relatively new and emerging, and that threaten privacy, autonomy, authenticity, safety, and other values *could have been otherwise*, and can still be reformed.

Chapter Two by Donald and Elizabeth Searing is primarily focused on three case studies that concern risk and responsibility for what they identify as three kinds of pervasiveness: of sensors, of effectors, and of systems. The first kind is exemplified by intrepid off-road enthusiasts who mistakenly trust their GPS and mobile phone to safely deliver them and their SUV through a Death Valley drive (their technology-inspired fearlessness is not rewarded). The second kind is shown by the (now) well-known Stuxnet worm that attacked Iranian centrifuges, and the not-so-well understood risk that this technology poses for other industrial and military systems that share the same control logic. The third case of pervasiveness is an example of trading algorithms contributing to the “Flash Crash” on U.S. stock exchanges, and the financial ripples that ensued.

Chapter Three by Lisa M. Lee presents the issue of “syndromic surveillance”, which involves gathering data on individuals who might be sick without their consent. It illustrates a collision of the ethics of public health and privacy—and one that obviously concerns epidemiologists at the U.S. Centers for Disease Control and Prevention where she works. But the issue of whether to pursue a public good to combat greater illness in a population at the cost of individual privacy is a fascinating philosophical problem too. She uses J.S. Mill’s harm principle, which she takes to give a prima facie justification for the invasion of individual privacy to prevent group harm, as a foil for her “framework for national privacy protection of public health data collected for any legitimate public health use—including public health surveillance” (Lee and Gostin 2009, p. 50). Her defense of an account that values “population health” over “individual health” will seem all too brief for the theoretically inclined, but the essay does invite the reader to contemplate how technology can desensitize public health officials to the ethical implications by effectively “hiding” the gathering of data from the individual.

A political and cultural critique of “big data” monitoring and surveillance by Mark Andrejevic constitutes the fourth chapter of the collection. This essay is the most wide-ranging and provocative in the book. His focus is on six characteristics of (really, slogans for) this type of emerging surveillance:

1. Tracking is “populational”;
2. Correlation and predictability are trump;
3. Monitoring is pre-emptive;

4. Tracking is interventionist;
5. All information is relevant; and
6. Privacy is irrelevant.

Andrejevic does not allow the critique to remain implicit. He includes in the downsides of surveillance “the creation of vast, omnivorous, and costly databases concentrated in the hands of large institutional actors” (p. 67). There is not so much an argument as it is a dystopian picture—and a powerful one at that—but the reader may well want a book-length treatment to justify the conclusions. And this is not to disparage the picture.

The ethics of spatial tracking and quantitative location-based identification of users of technologies are the topics of Chapter Five, by Francis Harvey. For the reader who is unaware of ethical issues in contemporary geography, this discussion will be eye opening. The gathering, storage, aggregation, and analysis of location-based data now makes possible many threats to individual privacy and anonymity that pre-computer civilizations could not have imagined. Harvey gives many examples, from GIS and geocoding to RFID and Google’s Street View, all of which allow a kind of quantitative “knowing” by the systems that process these data. Whether such knowledge will be exploited has already been decided; companies use these data to identify potential markets and actual consumers. Governments use the data for other national security and public safety objectives. This chapter could have been longer, as Harvey’s examples sometimes beg for a fuller description. But this essay opens many avenues for ethical and political exploration.

In Chapter Six, Cynthia M. Jones considers the threats to human dignity and autonomy in the use of PICT for elderly populations, especially those who are significantly “diminished” by diseases such as Alzheimer’s. She unpacks the concepts of privacy, competency, autonomy, and paternalism in the context of healthcare practices, such as the use of advance directives, and the goal of “aging in place.” When PICT is added to such eldercare situations—already fraught with moral difficulty—Jones wonders whether the net benefit of the technology might be made greater by consideration of the ways in which there are significant moral costs. She asks us to think about whether PICT in the homes of the vulnerable elderly ought to be making “life-and-death” decisions. Even the biggest techno-enthusiast ought to be struck by such questions, and Jones provides a succinct account of why this is so.

Chapter Seven on the ethical dimensions of electronic healthcare (e-Health), by Kathleen D. Seelman, Linda M. Hartman, and Daihua X. Yu, is the longest in the book, and it covers much ground. The authors break down aspects of e-Health such as health records, information, informatics, diagnostic and decision-support systems, telehealth, healthcare law, healthcare business, and so on. They also cover topics in ethics—from the theory of biomedical ethics to machine ethics—although their treatment of these topics is cursory. Their main concern seems to be with responsibility: how e-health in all its various forms complicates

responsibility, and also how it provides decision points for *someone* to intervene, or at least to take ownership of the complicated way in which e-health will structure and deliver healthcare. Here one is reminded of the lesson of Kitty Genovese: from the claim that someone ought to do something, it does not follow who exactly that someone is. If nothing else, the authors have shown what a seriously difficult affair the ethics of e-health has become.

Chapter Eight, a discussion of augmented reality by Bo Brinkman, stands out as the most future-oriented and epistemologically-rich essay in the collection. Brinkman writes that augmented reality “puts a computer between our senses and the real world” in a way that “makes virtual objects appear to be a part of the real world” (p. 149). What’s ethically interesting about such a compound reality? Brinkman thinks that it will challenge our Lockean conceptions of property, intellectual and real, when one’s experience is not limited by what is actually before the senses. Rather, one’s experience will be a mash-up of what is available to the senses and what Google and other technology companies can supply to us. Advertising will clash with the expectations of the “augmented” individual, and there will be a possibility of extortion by those who want to intervene in the individual’s experience by superimposing an undesirable image. Of course, if augmented reality does become so troublesome, there is an alternative that Brinkman does not seem to take seriously; we could turn it off. So even though I do not doubt both the appeal and the risk of augmented reality, I cannot see its inevitability.

Katie Shilton in Chapter Nine gives an ethnographic account of a case of values-in-design, through her 2-year participation in a project for UCLA’s Center for Embedded Network Sensing (CENS) to collect data about people from their mobile phones and environments. Shilton’s role was as a values advocate—more precisely, as a kind of privacy interventionist—who sought to influence the design conversations of the technologists with ethical and social considerations. Shilton describes her engagement with the engineers by way of the metaphor of a *value lever*, a way of re-orienting the design to take into account considerations that go beyond the technical. Shilton was able to introduce both ethical principles and values into her discussions with the technical teams, and thus to improve the end product. Her experience and its depiction in the scholarly literature should embolden other social scientists and empirically-oriented ethicists to undertake similar projects.

In Chapter Ten, Keith Miller employs an outgrowth of the PAIT workshop beyond this volume--the online account known as “[Moral Responsibility for Computing Artifacts: The Rules](#)”. Miller’s essay is a kind of conceptual demonstration; he shows how “The Rules” might apply to hypothetical cases of PICT, and also to the three case studies from Chapter Two. Miller distills some of the lessons of “The Rules” to illuminate the ethics of PICT in terms of shared, individual, and user responsibility, context awareness, and transparency. In considering the Searings’ real-life cases of the GPS adventure in Death Valley, Stuxnet, and the

Flash Crash, Miller does not claim that the “The Rules” will resolve all of the relevant ethical issues. Rather, he shows how they would be helpful and at the same time ethically rich. There is no pretension to completeness or consistency; “The Rules” are just a tool, but a powerful one at that.

The final chapter is editor Pimple’s opportunity to tie together the ethics of PICT with a survey of ethical principles from famous sources—Kant, Bentham and utilitarianism, the Bible, and some contemporary accounts. Here he mines the sources for compatible principles that can be applied to PICT, as opposed to favoring one account over others. Pimple conceives of these principles as a kind of “Belmont” account for PICT. The principles that he derives concern anticipatory ethics, extended consequences, anti-malice, proportional safety, transparency, informed choice, privacy, and maximum access. In the description of each principle, he briefly discusses an actual or near-term ethical problem that PICT presents, and how the relevant principle applies.

In sum, this collection of essays is accessible and inviting. While the authors sometime uncover more questions than they answer, I take this to be a virtue of a collaborative work on emerging technology. The book would be suitable as an advanced undergraduate or graduate text, and is interesting for its variety of approaches as well as the many examples of PICT that are described herein.

References

Lee, L. M. and L. O. Gostin. 2009. “Ethical collection, storage, and use of public health data: a proposal for a national privacy protection.” *JAMA* 302 (1):82-4.

¹ The complete title of the 2010 workshop held in Cincinnati was “Ethical Guidance for Research and Application of Pervasive and Autonomous Information Technology (PAIT)” and was organized by the editor, Ken Pimple, along with Indiana University’s Poynter Center and the Association for Practical and Professional Ethics. Another outgrowth of the PAIT workshop has been the online list known as “[Moral Responsibility for Computing Artifacts: The Rules](#)” organized by Keith Miller, one of the reviewed book’s authors.