Dainow, B. O. (2017). Threats to Autonomy from Emerging ICTs. *Australasian Journal of Information Systems*, 21, 1-16. doi:10.3127/ajis.v21i0.1438

Review

Dainow's publication addresses perhaps the most important current issue: the threat that emerging ICTs have on human values which are not uniformly agreed upon and which fail to be correctly regulated by professional design ethics. The literature is rich with value considerations, in engineering (Gordijn & Akkermans, 2003; Manders-Huits, 2010), philosophy (Nissenbaum & Walker, 1998; J Weckert, 2007), ICT (Burmeister, 2010, 2012, 2016; Friedman, Hendry, & Borning, 2017; Ridgley, 2009; Teipel et al., 2016), as well as robotics/AI (Sharkey, 2014; A van Wynsberghe, 2015), yet Dainow's focus brings a refreshing new perspective. The systematic approach, by way of using the ETICA project, is an excellent frame. Not only is it appropriate, using one of the best sources of an information on the ethical concerns of emerging ICTs, it creates a pleasing flow for the examination.

The literature on autonomy was well sourced and the versions well defined. Dainow linked those definitions through the similarity they share, "self-governance" (2017), to ICTs and the threat that each has on autonomy. Although a great deal has been written about codes of professional practice (Al-Saggaf, Burmeister, & Schwartz, 2017; Bowern, Burmeister, Gotterbarn, & Weckert, 2006; Burmeister, 2013, 2017; Burmeister & Weckert, 2003; Capurro & Britz, 2010; Gotterbarn, 2009; Pye & Warren, 2006; John Weckert & Lucas, 2009), Dainow's differing versions on autonomy, and the examination, should be used to inform professional codes of ethics and conduct. This is an area where more work needs to be done.

Noting the potential deceptiveness that AI may play in affective computing and ambient intelligence is a much needed warning for a very real concern. Perhaps AI could have also been discussed in other contexts where the AI isn't the enabler but the entire system, such as a companion carebot avatar like the Responsive Interactive Advocate (RITA) (Garner, Powell, & Carr, 2016). RITA lacks robotic components and is purely an AI system. RITA is not an enabler like a carebot with robotic components such as My Spoon (Aimee van Wynsberghe, 2013). Some AI systems, like companion carebots, emulate not only emotions (Dainow, 2017) but consciousness and a subjective experience while giving users the impression that they truly possess those qualities that they emulate. That being said, the threats that AI systems create regarding autonomy are the same as those from affective computing but just from the perspective of the AI system itself and not just as an enabler of another ICT.

The examples to describe the technologies are many. Such as referencing medicine delivery technology in bioelectronics (Dainow, 2017). But, more specific cases of particular emerging ICTs that threaten autonomy would make for a more informative paper. For example, the U2-Apple incident where 500 million Apple iPhone and iPod users had a music album automatically downloaded onto their device (Booth, 2014). The automatic download, albeit free, made personal choices for users that threatened their autonomy in a small way. This example could have concluded the human-machine symbiosis section rather than a general reference to enforced software updates (Dainow, 2017). Granted, it might be the case that since the paper focuses on emerging ICTs, then specific cases are obscure or limited.

It is made clear that personalisation of emerging ICTs secures or safeguards autonomy. This point is reinforced by almost all of the closing sentences on each of the emerging ICT sections. Each of those closing remarks describe that a failure to allow personalisation threatens all

forms of autonomy. The solution Dainow presents (personalisation capabilities) is the proper conclusion to the threat.

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Brandt Dainow's Response

Adam Polson's comments are appreciated. His suggestion for specific examples, and those he provides, are insightful - and raise an interesting question of methodology. I chose to use the ETICA findings because they constitute a robustly developed taxonomy of technologies. Obviously a discussion of how ETICA identified these technologies was beyond the scope of a 6,000 word paper. In fact, ETICA did not start with a taxonomy, but by examining specific ICT developments. ETICA analysed literally hundreds of ICT systems, from both commerce and academic research, in multiple countries, initially using bibliometric analysis of thousands of documents (Veikko, Kanerva, and Kouri 2009), then surveys and expert panels (Heersmink et al. 2010). From this data they developed the set of fourteen technology groups (Ikonen et al. 2010). My conversations with ETICA project members indicate that there was often "passionate" debate about where some systems sat in the taxonomy, though (obviously) you won't see those debates in the final publications. So, from a methodological perspective, selecting specific, current, examples of each technology group risks raising a distracting disagreement about whether that example really does belong to that group. ETICA chose to tackle this issue with the development of scenarios describing someone's interaction with technologies of each group. The emphasis in these scenarios was not so much the features and operation of the system as the impact of that style of technology - much more accessible for politicians, but much less satisfying for readers of the AJIS.

The underlying issue for ICT ethics in this regard is that, in fact, few technologies impact a person in isolation. While it is possible to discuss them individually, one ICT's impact on the person's life can rarely be separated from the impact of other ICT's supporting that system, or being delivered at the same time. Many deployed ICT's depend on others for their delivery, and the operation and design of those systems can deeply affect the way in which the delivered ICT interacts with the person (Dainow 2017). Likewise, the ethical impact of many ICT's depends not on the system, but the business model under which it is delivered (Dainow 2015), as Adam's reference to the Apple incident shows. From a pedagogical perspective, this raises issues for teaching ethics in computer science. We must teach students how to construct individual systems, because that's how people must work. However, to have an ethical understanding which can inform their coding, they need to be aware of the context in which their systems will be deployed; both in terms of other interacting technologies and in terms of the business model under which it will be rolled out. At this stage, ethical education within university Computer Science departments is rare and lacks established methodologies. The task is thus finding a way in which we can make accessible to students the complexity of philosophical concepts and the close interaction between business and technology, as well as how every line of code has the potential for ethical impact. Many pedagogical approaches are being developed, but it seems to me the most likely to succeed is to cultivate concrete principles similar to formal standards and protocols, but which embed ethical conduct. For example, Langheinrich's Principles for Privacy-Aware Ubiquitous Systems (Langheinrich 2001) offer simple rules which make systems both more ethical.

Moreover, the range of versions of autonomy conceals an even greater complexity. Irrespective of how it is understood, autonomy involves allowing each person to determine how they live for themselves. Even if one is restricted to a single version of autonomy, one is still confronted by a vast range of lifestyles. Unless a system is trivial, one-size-fits-all is almost always going to restrict someone's autonomy somehow.

References

Al-Saggaf, Y., Burmeister, O. K., & Schwartz, M. (2017). Qualifications and ethics education: the views of ICT professionals. *Australasian Journal of Information Systems, 21*.

Booth, R. (2014). U2's Bono issues apology for automatic Apple iTunes album download. *The Guardian*. Retrieved from https://www.theguardian.com/music/2014/oct/15/u2-bono-issues-apology-for-apple-itunes-album-download

Bowern, M., Burmeister, O. K., Gotterbarn, D., & Weckert, J. (2006). ICT Integrity: Bringing the ACS Code of Ethics up to date. *Australasian Journal of Information Systems, 13*(2), 168-181. doi:10.3127/ajis.v13i2.50

Burmeister, O. K. (2010). Websites for seniors: Cognitive accessibility. *International Journal of Emerging Technologies and Society, 8*(2), 99-113.

Burmeister, O. K. (2012). What seniors value about online community. *Journal of Community Informatics, 8*(1).

Burmeister, O. K. (2013). Achieving the goal of a global computing code of ethics through an international-localisation hybrid. *Ethical Space: The International Journal of Communication Ethics, 10*(4), 25-32.

Burmeister, O. K. (2016). The development of assistive dementia technology that accounts for the values of those affected by its use. *Ethics and Information Technology, 18*(3), 185-198. doi:10.1007/s10676-016-9404-2

Burmeister, O. K. (2017). Professional Ethics in the Information Age. *Journal of Information, Communication & Ethics in Society, 15*(2).

Burmeister, O. K., & Weckert, J. (2003). Applying the new software engineering code of ethics to usability engineering: A study of 4 cases. *Journal of Information, Communication & Ethics in Society, 3*(3), 119-132.

Capurro, R., & Britz, J. B. (2010). In search of a code of global information ethics: The road travelled and new horizons. *Ethical Space: The International Journal of Communication Ethics, 7*(2/3), 28-36.

Dainow, B. (2017a). Threats to Autonomy from Emerging ICTs. *Australasian Journal of Information Systems, 21*, 1-16. doi:10.3127/ajis.v21i0.1438

Dainow, B. (2017b). 'Smart City Transcendent - Understanding the Smart City by Transcending Ontology'. *Orbit* 1. https://www.orbit-rri.org/volume-one/smart-city-transcendent/.

Dainow, B. (2015). 'Key Dialectics in Cloud Services'. *Computers & Society* ETHICOMP Special Issue: 52–59. https://doi.org/10.1145/2874239.2874247.

Friedman, B., Hendry, D. G., & Borning, A. (2017). A Survey of Value Sensitive Design Methods. *Foundations and Trends® in Human–Computer Interaction, 11*(2), 63-125. doi:10.1561/1100000015

Garner, T. A., Powell, W. A., & Carr, V. (2016). Virtual carers for the elderly: A case study review of ethical responsibilities. *Digital Health, 2*, 1-14. doi:10.1177/2055207616681173

Gordijn, J., & Akkermans, H. (2003). Value based requirements engineering: exploring innovative e-Commerce ideas. *Requirements Engineering Journal, 8*(2), 114-134.

Gotterbarn, D. (2009). ICT Governance and What to Do About the Toothless Tiger(s): Professional Organizations and Codes of Ethics. *Australasian Journal of Information Systems, 16*(1). doi:10.3127/ajis.v16i1.601

Heersmink, R., Timmermans, J., van den Hoven, J., & Wakunuma, K. (2010). 'D.2.3 Normative Issues Workshop Report'. ETICA Project.

Ikonen, K., Kanerva, M., Kouri, P., Stahl, B., and Wakunuma, K. (2010). 'D.1.2. Emerging Technologies Report'. ETICA Project.

Langheinrich, M., (2001). 'Privacy by Design - Principles of Privacy-Aware Ubiquitous Systems'. In *Proceedings of the Third International Conference on Ubiquitous Computing*, edited by Gregory Abowd, Barry Brumitt, and Steven Shafer, 273–91. LNCS. Atlanta, USA: Springer-Verlag.

Manders-Huits, N. (2010). What values in design? A critical analysis of value-sensitive design. *Science and Engineering Ethics, 17*(2), 271–287.

Nissenbaum, H., & Walker, D. (1998). Will computers dehumanize education? A grounded approach to values at risk. *Technology in Society, 20*(3), 237-273.

Pye, G., & Warren, M. (2006). Striking a Balance Between Ethics and ICT Governance. *Australasian Journal of Information Systems, 13*(2). doi:10.3127/ajis.v13i2.53

Ridgley, C. M. (2009). The Decision Disconnect. *Australasian Journal of Information Systems, 16*(1). doi:10.3127/ajis.v16i1.602

Sharkey, A. J. C. (2014). Robots and Human Dignity: the effects of robot care on the dignity of older people. *Ethics and Information Technology, 16*(1), 53-75. doi:10.1007/s10676-014-9338-5

Teipel, S., Babiloni, C., Hoey, J., Kaye, J., Kirste, T., & Burmeister, O. K. (2016). Information and communication technology solutions for outdoor navigation in dementia. *Alzheimer's & Dementia: The Journal of the Alzheimer's Association, 12*(6), 695-707. doi:10.1016/j.jalz.2015.11.003

van Wynsberghe, A. (2013). Designing robots for care: Care centered value-sensitive design. *Science and Engineering Ethics, 19*(2), 407-433. doi:10.1007/s11948-011-9343-6

van Wynsberghe, A. (2015). *Healthcare Robots: Ethics, Design and Implementation*: Ashgate Publishing, Ltd.

Veikko, Ikonen, Minni Kanerva, and Panu Kouri. 2009. 'D.1.1 Heuristics & Methodology Report - Final'. D.1.1. ETICA Project.

Weckert, J. (2007). *Social values and nanotechnology*. Presentation. CAPPE, Charles Sturt University. Canberra, Australia.

Weckert, J., & Lucas, R. (2009). The Governance of Information and Communication Technology. *Australasian Journal of Information Systems, 16*(1). doi:10.3127/ajis.v16i1.599