Journal of Information, Communication and Ethics in Society

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GUEST EDITORIAL

20 years of ETHICOMP: time to celebrate?

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Abstract

Purpose – The purpose of this paper is to give an introduction to the special issue by providing background on the ETHICOMP conference series and a discussion of its role in the academic debate on ethics and computing. It provides the context that influenced the launch of the conference series and highlights its unique features. Finally, it provides an overview of the papers in the special issues.

Design/methodology/approach – The paper combines an historical account of ETHICOMP and a review of the existing papers.

Findings – ETHICOMP is one of the well-established conference series (alongside IACAP and CEPE) focused on ethical issues of information and computing. Its special features include: multidisciplinary and diversity of contributors and contributions; explicit outreach to professionals whose work is to design, build, deploy and maintain specific computing applications in the world at large; creation of knowledge that is accessible and relevant across fields and disciplines; intention of making a practical difference to development, use and policy of computing principles and artefacts; and creation of an inclusive, supportive and nurturing community across traditional knowledge silos.

Originality/value – The paper is the first one to explicitly define the nature of ETHICOMP which is an important building block in the future development of the conference series and will contribute to the further self-definition of the ETHICOMP community.

Keywords Ethics, Computer ethics, Computer science

Paper type Viewpoint

In 1995, Terry Bynum and Simon Rogerson brought together a group of scholars to explore and discuss ethical issues arising from the use of computers. This was the occasion of the first ETHICOMP conference that took place at De Montfort University in Leicester, UK. Twenty years later, in September 2015, ETHICOMP returns to its roots for the first time and the 20th anniversary of the conference will again be held in Leicester. This special issue celebrates the occasion and expresses our appreciation of the founders of the conference series, who managed to develop and sustain a group of scholars who have been working in this important field.

In this editorial, we[1] raise four questions:

Q1. What is special about ETHICOMP?

Q2. What has ETHICOMP achieved?

Q3. What does the ETHICOMP community want to do in the future?

These three questions together help answer a fourth:

Q4. What is there to celebrate after 20 years of ETHICOMP?

We first offer some historical background to ETHICOMP and related conferences, so as to make some initial responses especially to the first question. We will then look more carefully at the papers collected in this special issue, both for their own sake and with a view towards extracting what they tell us about the conference. All of this will then serve as grounding for further responses to these three questions, most especially regarding the future of the ETHICOMP community and conferences.

To begin: to understand what is special or distinctive about ETHICOMP requires a brief overview of its sister scholarly associations and conferences. While now approaching its 20th anniversary, ETHICOMP is neither the oldest nor the youngest of associations and conference series devoted to exploring the intersections of computation and ethics. To begin with, what is now the International Association for Computing and Philosophy (IACAP) began in the 1980s, first in affiliation with larger philosophy conferences, followed by its first stand-alone Computing and Philosophy (CAP) conference in 1986[2]. IACAP traces its initial philosophical interests back to early work on logic and computer-assisted instruction in logic. Indeed, Terry Bynum – also a prominent and influential member of the IACAP community since its early days – has argued that contemporary computer ethics begins with the foundational work of Norbert Wiener: more generally known as a founding figure in the definition and development of cybernetics, Wiener's *The Human Use of Human Beings: Cybernetics and Society* ([1950] 1954), as the title suggests, takes up many of the ethical as well as social and political issues evoked by the emergence, use and diffusion of computational technologies (Bynum, 2000)[3]. Echoing Wiener's extensive array of concerns, the IACAP conferences continued to expand the umbrella of "the computational turn" in philosophy to include philosophical investigations into Artificial Intelligence (AI), diverse aspects of computer ethics, cognitive science, game theory, electronic democracy, virtual reality, trust online, distance learning, cultural values and Internet-based communication, robots and social robots and so on. For its part, the International Society for Ethics and Information Technology (INSEIT) was formed in 2000, and sponsors the annual Computer Ethics: Professional Enquiry (CEPE) conference. As these names make explicit, INSEIT and CEPE share with ETHICOMP a more precise focus on ethics. Beyond matters of distinctive histories and cultures – as we will elaborate below, ETHICOMP emphasizes inclusion of computer professionals beyond the academy, while INSEIT tends to emphasize primarily philosophy and computer science within university settings. At the same time, while each conference and supporting community of scholars and researchers is thus distinctive in important ways – it is also that case that many of us participate in all three.

More broadly, this overview makes clear that 20 years is a long time in a fast-moving academic field. But just being around for 20 years is probably not enough to warrant the efforts linked to a special issue. It is therefore worthwhile asking what is there to celebrate? This question is not only one raised in this editorial: it is possibly even more important for the community of scholars who spend significant efforts and resources to

make the conference and the conference series possible. ETHICOMP has been a strong presence in the field of ethics and computing. For example, this year, for the 2015 conference, we received more than 90 submissions. This is a strong indicator that the conference remains attractive. We should therefore ask what makes it attractive with a view to ensuring that the positive features will be sustained and strengthened in the future to allow the community to grow and prosper.

A closely related question is what the conference series has achieved. The fact that many of us return to it regularly indicates that it has achieved outcomes that we value. The "we" in the previous sentence refers the members of the ETHICOMP community: individuals who write papers, present them, review them, read them; the people who attend the conference in many cases year after year; the people who come together to discuss the role of computing in our societies and the question of the ethical values and consequences linked to the ever-growing importance of technology in the modern world.

And finally, there is the question of what the future holds and what expectations the ETHICOMP community has. What are the topics we want to explore in the future, what are the outcomes we hope for and where do we collectively want to go?

Before we go further, however, it is worth briefly going back in time to remember the world of computing as it was in 1995 and thinking about the changes in the area during the past 20 years. These changes go a long way towards explaining why ETHICOMP not only still exists but continues to grow and attract new audiences.

In 1995, computing was already well on its way to becoming the pervasive technology that it is today. Windows 95 and Internet Explorer (launched in 1995) continued to popularize the graphical user interfaces (GUIs) made commercially successful with the introduction of Macintosh computers in 1984: these are pieces of software whose successors still shape our everyday experience, most especially on mobile devices such as tablet computers and smartphones, which (usually) lack a physical keyboard. While the World Wide Web was still in its infancy, one could already find pictures of cute cats on the Internet. The era of the personal computer was well on its way, but a PC was still a fairly substantial investment. In most Western countries, it was possible to get a connection to the Internet, but one needed an expensive modem to get a fairly slow connection. Creating a website was a feat reserved for the technically capable.

The shape of the technical infrastructure we see today was clearly discernible. At the same time, many of the fixtures of today's technology environment were not yet there. Larry Page and Sergey Brin first met at Stanford in 1995, several years before starting Google[4]. It was still almost a decade until the launch of Facebook, and even the earliest social network sites were not yet around. To be sure, email, listserves and text-based virtual worlds such as MUDs and MOOs emerged in 1980s' instantiations of Computer-Mediated Communication (as made commercially available through enterprises such as CompuServe and America Online, alongside National Science Foundation supported ancestors to the contemporary Internet, such as BITNET, etc.). But Internet relay chats were a relatively rare phenomenon enjoyed by the nerdy. And while antecedents to contemporary social media are part of the earliest history of the Internet, such as the "virtual community" The Well (Rheingold, 1993), the idea that one would use one's computer to purchase goods would have been alien to most people who had heard of the Internet[5]. The dot.com boom which famously burst around the turn of the millennium had not even started. Amazon.com went online in 1995[6], but it does not seem likely that any of the original ETHICOMP attendees would have bought anything on the Internet.

This very short overview may serve to indicate one of the reasons why ETHICOMP is relevant. Technology develops, it develops quickly and possibly more quickly now than ever before. This is not the most important story to be told, however. The important qualitative change that can be observed over the past 20 years is not the technical development but the way in which computing technologies have become integrated into our lives. Today's laptop is of course much faster than its predecessor in 1995, but more importantly, it has a completely different function. And this function is what affects people's lives, the way they work, interact, come together make decisions, fall in love, wage war and most other aspects of our lives. This is all the more so, of course, as mobile networked computers – e.g. in the form of tablet computers and what are somewhat misleadingly called smartphones – are more and more our most common way of accessing the Internet and its riches (while – at least occasionally – also making a phone call). The now wildly diverse applications of computing – including primary uses as communication devices – are the reasons why a formerly fairly boring business technology now has clear and extensive ethical implications. To be sure, especially for some computer professionals such as Wiener, this is nothing new. Indeed, a 1995 special issue of the professionally oriented *Communications of the ACM* on "Ethics and Computer Use" raised many of what we would recognize today as classic or standard issues, beginning with privacy, intellectual property, accountability, regulating "cyberspace" and the importance of "teaching ethical computing" (Huff and Martin, 1995). But if you told someone in a pub in 1995 that you are interested in ethics and computing the typical response would have been incomprehension. In 2015, telling a stranger at the bus stop the same thing is much more likely to be met with understanding and sympathy.

It is now widely accepted that computing is of high ethical and social importance. This explains why work on computing and ethics is going strong. But again, ETHICOMP is not the only venue where such work is discussed. To more fully address the question of what ETHICOMP stands for – what are the features that distinguish it from other conferences and their communities – we now turn to the papers collected in this special issue. That is, reviewing them will not only serve as an introduction to the special issue: in addition, as we take them to be representative of the ETHICOMP community and conference, this review will further help us uncover specific details and insights that will help sketch out a more fine-grained account of ETHICOMP.

The first paper in this special issue is one that explicitly reflects on the question of the relevance of ETHICOMP and nicely sets the scene for the special issue. Richard Volkman's (this issue) paper uses the occasion of the 20 years of ETHICOMP to reflect on the road and purpose as well as the theoretical underpinnings of computer ethics. He argues that throughout the history of ethics and computing research, there has been a dominance of approaches that focus on compliance, but this focus is intellectually unsatisfying and practically unlikely to be successful. He argues that we need to understand the reason for the importance of computer ethics because ethics has to do with what we care about. If an agent cares about something, then extrinsic motivation as implied by compliance-oriented approaches is no longer required. Volkman provides a strong argument why ethical education needs to open new avenues and reflexivity. It has to be linked to an invitation to explore the world with an open mind. This has important implications for the role of theory and the type of theory that should be taught. Volkman proposes the idea of the "big tent" of computer ethics in which there is space for a number of competing and possibly even

contradicting theoretical positions. His proposal as to which theories should be included in this big tent is that they should be conducive to an open mind, open-ended enquiry and provide insights that allow its users to "see for themselves what matters and why". For him, ETHICOMP is a venue that caters to this plurality and openness and allows the exchange of different ideas in a supportive environment.

Volkman's paper is the first in our collection because it focuses most explicitly on ETHICOMP and its characteristics. The other papers can be read from this perspective as examples of the big tent of ETHICOMP, the broad range of ideas positions theoretical and practical approaches to understanding what constitutes ethics in the context of computing and what could or should be done to ensure that ethical considerations are given due weight. Randy Conolly's (this issue) paper picks up Volkman's focus on the question of teaching computer ethics, which has been a strong current throughout the two decades of ETHICOMP. He argues that much of the teaching of computer ethics is focused on an ethical analysis of possible consequences of computer use, which is often done through the application of traditional ethical theories to case studies. This approach, according to Conolly, is insufficient, as it implies a deterministic approach to technology which has been discarded by research informed by the social sciences. We, the editors, may not be totally convinced that this description of the status of teaching of computer ethics is accurate, as we know that there is broad field of approaches to teaching the subject. We concede, however, that a focus on good and bad consequences may well be widely spread in some areas, in particular, where the ethics of computing is taught by nonspecialists. The value of Conolly's contribution is that it highlights insights that can be drawn from neighbouring disciplines such as science and technology studies which can enrich our understanding of the social nature and consequences of computing and thereby making important contribution to the teaching of the subject. Conolly's paper furthermore highlights another defining feature of ETHICOMP, namely, the fact that its contributors and members of the community come from a broad range of disciplines which makes for interesting debates but can also cause misunderstandings and unsuccessful communication.

Conolly's critique of the teaching of computer ethics is followed by a very different paper in which Soraj Hongladarom (this issue) explores the ethical and metaphysical aspects of a maybe not too distant future in which it will be possible to use computing devices to directly link different brains. This type of technical development may sound very much like science fiction, but according to Hongladarom, it may well be technically possible within the next 20 years. Assuming this possibility requires philosophical consideration to ensure we are prepared when it happens. Hongladarom highlights the importance of privacy consideration as the key ethical aspect that will be raised by this type of technology. The importance of this paper is that it demonstrates a willingness to engage with longer-term and distant issues and take seriously the question whether and what can be done about them at present. Viewed from this perspective, it matters less whether these technologies are feasible in principle and whether current technical approaches are likely to lead to their realization. What is more important is whether they allow us to reflect on our visions of ourselves, fundamental questions such as what it means to be human and how technical developments can influence our view of ourselves. If the paper achieves this and encourages us to think in new ways and ask questions to which we do not have an answer yet, then it can count as a good example of what ETHICOMP can achieve.

Where Hongladarum's work reaches to the future to raise fundamental questions, Nancy Poloudi and her co-authors (this issue) look at much more immediate question arising from existing technologies. They explore problems that arise from the use of three-dimensional (3D) environments and virtual worlds. Their specific interest is in applications of such technologies in commercial settings. By reviewing the literature on the ethics of 3D online environments, they identify possible ethical issues, individuals that are involved in them and suggest possible solutions. From the perspective of this special issue, this paper is important not only because it covers a current and immediate concern arising out of existing technologies, but also because it looks at the commercial environment in which they are applied and where the ethical questions are raised.

The commercial context in which computing technologies are developed and implemented can raise numerous questions from an ethical perspective. It is therefore not surprising that this represents a key concern of the ETHICOMP community. One important stream of debate that has formed a pillar of the conference discussions over the years is that of professionalism. In this special issue, questions of ethics and professionalism in IT are covered by the paper by Yeslam Al-Saggaf, Oliver K. Burmeister and John Weckert (this issue). They present an empirical study located in Australia that looks at the reasons behind an ethical behaviour. The qualitative study identifies major causes of unethical behaviour, and identifies strategies of dealing with such conduct.

This theme of trying to understand reasons for unethical behaviour is continued by Aimee van Wynsberghe and Jeroen van Ham (this issue). The starting point for their investigation was the question whether legislation had the desired impact of affecting the behaviour of users of a file sharing site. Rather than focusing on this question, the paper discusses the ethical problems arising from the collection of data in this context. This paper is typical of ETHICOMP in several ways. Its point of departure is the long-standing debate around intellectual property, its justification and implementation. It dated the difficult relationship between ethics and law were neither of those tests to be clear in the technical environments. The paper demonstrates the difficulty of applying the traditional research ethics concept of informed consent in online settings. One of the important aspects of the paper is that it is the outcome of collaboration between a computer ethicists and a computer scientist. The starting problem was identified by the computer scientist who then invited the ethicist to work with him to identify the ethical questions and possible solutions. The suggested approach focuses on the concept of values and links the discussion to debates on values, their conflict and implementation in technology, thus pointing to the question of value sensitive design. The paper includes practical suggestions and outcomes by giving advice on ways of dealing with privacy concerns in online data collection through a framework for ethical data provenance.

The following paper by Neeraj Sachdeva (this issue) looks at another topic with a long history of discussion in ETHICOMP, namely, that of digital divides. The specific focus of the paper is to investigate how the use of computing technologies and the Internet in particular affects people with and without impairments in different ways. The paper reports on a systematic literature review. It highlights the multitude of dimensions that affect the degree to which individuals can benefit from digital technologies. The paper concludes by spelling out the practical implications that arise from the framework proposed by the authors.

Bill Fleischmann (this issue) uses the subsequent paper to discuss another big issue that modern societies face, namely, the increasing efforts in developing and

subsequently deploying autonomous weapons. The question of machine autonomy and the ethical evaluation of actions by machines which are not immediately caused by human intervention is one that exercises the computer ethics community significantly. It becomes even more prominent and clearly ethically relevant where the intended consequence of such autonomy is the death of enemy combatants. This question goes beyond computer ethics and touches political philosophy and centuries-old discussions around the nature of just war. Fleischmann proposes a very clear position: he makes an impassioned plea for outlawing autonomous weapons and categorically rejects any possible justification of their use. He clearly states that avoiding the development of such machines as part of the responsibility of the computer scientist and technical expert. The paper is a good example for the broad relevance of the computer ethics discussion and demonstrates the strength of conviction held by the author.

The remaining papers bring us back to the immediate focus of the special issue, namely, the ETHICOMP conference series and its contents and importance. Anne Gerdes (this issue) uses her paper to trace how ethics of computing has developed over the lifetime of the conference series by looking at the reflection of the topic in science fiction. She demonstrates that a key concern that is visible in the science fiction literature is that of the relationship of humans and robots. The discussion of science fiction is not just an interesting exercise for those interested in this literary genre but provides important insights into the way society represents technology and the relationship between humans and their technical environment. Gerdes concludes by reminding us that it is not enough to reflect on the ethics of technology but that scholars in the field ought to get involved in shaping and designing it.

A review of computer ethics and in particular the past 20 years that have witnessed the development of ETHICOMP is the starting point of the paper on Slow Tech by Diane Whitehouse and Norberto Patrignani (this issue). Their argument draws on the Slow Food movement and proposes that information and communications technology (ICT) in the future should be good, fair and clean. Good ICT places humans at the centre stage, partly by allowing humans to develop their potential and taking into account the limitations of humans in terms of information processing speed. This raises particular challenges in an environment that sees ever-faster ICTs and what can be termed hyperconnectivity. Clean ICT safeguard the environment in all stages of their life cycle, contributing to their environmental sustainability. Fair ICT, finally, aims for equitable use of technology, drawing on ideas of the fair trade movement. Whitehous and Patrignani explore the stakeholders who need to be involved to make their vision of Slow Tech a reality. They draw up a roadmap for Slow Tech that indicates the required behaviour by the different stakeholders that will make this vision a reality. The paper draws on and combines a number of streams of discussion within the ETHICOMP community and demonstrates how this can lead to a vision of an alternative socio-technical future.

Catherine Flick (this issue) focuses on the ETHICOMP conference from very different perspective by reflecting on what sets the conference apart from others. She develops this line of thought in reference to own experience. Flick perceives the ETHICOMP community as distinctive in that is supportive and protective in particular for young scholars who are seeking to establish their position and understand the debate in the field. She conveys a positive experience of the conference and the way in which it has supported her from being an early PhD student to an established member of the Centre for Computing and Social

Responsibility which is the home of the conference. To make sense of this role of the conference she draws on the literature on mentorship and extends the traditionally individual role of mentor by suggesting that ETHICOMP can be seen as a "community mentor". This suggestion bears testimony to the positive influence that the conference can have on the individuals who engage with it.

The special issue ends with a paper by Simon Rogerson (this issue), one of the fathers of the conference series. Rogerson looks at the history of ETHICOMP and finds that many of the questions that were discussed at the first conference in 1995 are still being discussed. He takes this as an indication of a lack of progress. In light of the dynamic landscape of technology, he suggests that more progress should be made to address ethical issues that are by now well known. Looking at recent publications as well as a number of research projects in the area, he comes to the conclusion that making more progress is imperative. His focus in addressing these issues is on the future. He emphasizes the importance of education as the way of influencing future professionals. The group who holds the key to solving the issues of computers and ethics for Rogerson are the millennials, the generation of people who have grown up with modern computing technologies and may use their familiarity with these technologies to find ways of overcoming their downsides.

Again, we believe that these papers provide an interesting insight into the type of thoughts and ideas that are discussed in ETHICOMP as well as the atmosphere and social dynamics within which they are developed. We can thus return to our defining questions: What is special about ETHICOMP? What has ETHICOMP achieved? And how does the ETHICOMP community want to do in the future?

To answer the first question, we believe that one special feature of ETHICOMP is constituted by the specific diversity of disciplines and background it combines. As with IACAP and INSEIT, ETHICOMP is explicitly (and, we would argue, necessarily) multidisciplinary: but more than its sister conferences, ETHICOMP explicitly reaches out and welcomes contributions from diverse disciplines *and practices* outside academia, most especially from professionals whose work is to design, build, deploy and maintain specific computing applications in the world at large. This means, secondly, that ETHICOMP aims to generate and disseminate knowledge across various boundaries and divides, and in ways that will be taken up but not only academic readers, but also business and professional practitioners. This leads directly to a third characteristic – namely, that much activity in ETHICOMP shares the aim of making a practical difference. Thinking about ethics and computing is important to understand relevant questions and formulate avenues of action. But it appears to be a broadly accepted assumption by members of the ETHICOMP community that practical consequences should follow from these insights. It is open to debate how successful the community has been in achieving practical change but the intention to achieve it is widely acknowledged.

Fourthly, all of the papers collected here thus share a focus on the professions and professionals directly engaged with making specific applications of computational technologies: hence, the distinctive ETHICOMP emphasis on a community inclusive of such professionals and the goal of making a practical difference. But this also highlights what is not only most distinctive about ETHICOMP, but also its most important contribution. That is, however, hard initiating and fostering interdisciplinary cooperation between the otherwise well-isolated "knowledge silos" of the contemporary university may be – in our view and experience, it is even more challenging to bring

together professionals from outside the academy into productive and enjoyable dialogue with academics. This has been a defining goal of ETHICOMP since its inception: it is arguably its most distinctive and important contribution.

All of this highlights in turn the importance and accomplishment of ETHICOMP as establishing and fostering a supportive and nurturing community. While IACAP and INSEIT would certainly share this aim as well, we all face the reality that academic conferences can be challenging and many readers will have experienced examples where the atmosphere was downright hostile. Despite our best intentions, an occasional conference participant can be more interested in asserting intellectual supremacy and putting down competing views than practicing the epistemological humility and openness to critical correction that are essential for fruitful interdisciplinary dialogue. ETHICOMP explicitly aims to foster a different culture, one where different viewpoints can be accepted and individuals who are new to the topic of ethics and computing or new to research and presentations are welcomed and supported. Research as the journey of discovery has to be undertaken by each scholar individually. If someone is at a point that was already discussed in the past, then this needs to be pointed out to them to avoid repeating mistakes of the past. But this can be done in a way that makes them appreciate the importance of the intellectual development they are following. It has thus always been an explicit policy of the organizers to integrate new scholars and open the door to new ideas.

Lastly, all of this sketches out a more precise focus on computer ethics as strongly emphasizing the ethical responsibilities and approaches of computer professionals – a focus most clear, articulate and fully developed (as we would expect) in Simon Rogerson's closing paper and call for "Future Vision", as "an initiative to address the serious fragmentation of work in and between academia and industry related to so-called ICT Ethics." Of course, such a call can only be fully endorsed and heartily applauded – first of all, as it exemplifies with particular clarity what we have now seen as the defining foci of ETHICOMP from the outset on bringing together professionals and academics in ways that will make needed and practical differences in our lives. This character of ETHICOMP is to a significant degree owed to the strength and enduring influence of Terry Bynum and Simon Rogerson whose vision of the conference still centrally shapes it. At the same time, these foci distinguish ETHICOMP with equal clarity from both INSEIT/CEPE and IACAP, both of which are marked by a more extensive array of foci and topoi, both within information and computing ethics as well as in other areas such as AI, computation and logic, social robotics and so on.

If these are the features that set ETHICOMP apart from other conferences, then one can immediately ask the next question: what has it achieved in the past 20 years? The answer is probably that the most important achievement is the creation of a community that cherishes open and diverse discussion and that recognizes the value that ETHICOMP can offer. The creation of this community went along with the development of a body of knowledge, as evidenced by the proceedings of the past conferences.

And where should ETHICOMP go in future? The various papers of the special issue give pointers as to where the authors think the conference should be heading. As a starting point, we can probably argue that the positive features of ETHICOMP should be preserved. The openness, the intellectual curiosity and the supportive environment should be retained. Some of the claims and intentions should be revisited, notably the one for practical relevance. Insofar as ethics is an applied discipline, we should gain a

better understanding of how it can be applied and what the practical consequences should be. Teaching and training are one aspect of this, but a broader relevance to industrial practice which shapes much of computing applications would be desirable. Engagement with policy on all levels is arguably as important as participation in the development of the computing profession.

ETHICOMP cannot and does not want to achieve this on its own. As we have seen, the sister conferences such as IACAP and most especially CEPE cover similar grounds in terms of content. Questions of the social and ethical consequences of computing exercise scholars in neighbouring disciplines ranging from law and science and technology studies to business and information systems. Professional bodies, funding organizations, university associations and many other groups play a role in this field. ETHICOMP should be ready to reach out to all of these, learn from them and openly interact with them to promote the shared goal of ensuring that computing, its artefacts and principles, contribute to a better world. This is a tall order with uncertain outcomes. But it is one that the ETHICOMP community has been working towards for 20 years. The prospect on working it for another 20 years may be somewhat daunting, but it is also a cause for celebration.

Notes

1. In addition to being the editors of this special issue, we were also the conference chairs of the 2014 and 2015 conferences and are thus part of the ETHICOMP community (along with others) – all of which informs our views and insights.

2. www.iacap.org/about/the-history-of-iacap/ (accessed 18 May 2015).

3. Indeed, Wiener has proven to be doubly prescient: he draws primarily on the traditions of virtue ethics and Enlightenment humanism – thereby anticipating virtue ethics as increasingly prominent in recent work in information and computing ethics (Ess, 2015).

4. www.google.com/about/company/history/ (accessed 13 May 2015).

5. A colleague working for IBM suggested to her bosses in 1995 that the World Wide Web might be useful for business: she was met with ridicule. Ultimately, of course, IBM figured it out.

6. http://en.wikipedia.org/wiki/Amazon.com (accessed 13 May 2015).

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