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ACM SIGCAS COMPUTERS and SOCIETY

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**Association for
Computing Machinery**

Advancing Computing as a Science & Profession

WHO ARE WE?

SIGCAS Computers and Society is the ACM Special Interest Group that addresses the social and ethical consequences of widespread computer usage.

SIGCAS' main goals are to raise awareness about the impact that technology has on society, and to support and advance the efforts of those who are involved in this important work.

Our members are computer professionals from both industry and academia, as well as ethicists, psychologists, sociologists and others. We welcome students from a variety of disciplines. Our areas of involvement include computer ethics, universal access to computer technology, security, privacy, and reliability. We collaborate with other ACM bodies that are engaged in related work, such as COPE, USACM, SIGITE and SIGCSE.

The ACM Computers & Society is an online publication accessible via the ACM Digital Library. The newsletter aims to be an effective communication vehicle between the members of the group.

Participation. Readers and writers are invited to join and participate actively in this Special Interest Group.

Membership is open to all, for US\$25 per year, and to students for US\$10 per year. The link to join up can be found on our web site, at <http://www.sigcas.org>

Contribute. The editor invites contributions of all types of written material (such as articles, working papers, news, interviews, reports, book reviews, bibliographies of relevant literature and letters) on all aspects of computing that have a bearing on society and culture.

Please note that it is NOT a peer-reviewed publication. Submissions are checked for relevance, accessibility and basic suitability by the editors but not fully peer reviewed.

For the latest Call(s) for Papers, or instructions regarding formatting guidelines and copyright policy please see the website: <http://www.sigcas.org/>. Submissions may be sent to editors_sigcas@acm.org.

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Richard Blumenthal Editor-in-chief

SIGCAS EXECUTIVE



Karla Carter SIGCAS Chair.

I come to you as a mixture of practitioner and academic. I'm an academic in the teaching sense. I'm an Associate Professor at Bellevue University, in Bellevue, Nebraska (not the Washington State one and not the New York City hospital one). I'm a bit of an odd duck in the world of CS/IT higher education as my undergraduate degree is in psychology and my graduate degree is in history. I have been working in the real-world of IT since 1991 and I still do consulting. Since 2006, I've been teaching IT at both the undergraduate and graduate level.



Samuel A. Rebelsky Vice Chair.

Samuel A. Rebelsky is a Professor of Computer Science at Grinnell College. His responsibilities include assisting the Chair in leading and managing SIGCAS.



Robert Beck Member-at-large.

Robert Beck serves as member-at-large of the SIGCAS Executive Committee. His responsibilities include managing SIGCAS's collaboration with a variety of conferences that address areas of impact of computing on society and the ethics of computing solutions to society's problems. In addition, he helps the SIG continue to serve as a significant organization working on computing and social responsibility, computing ethics, and the broader impacts of computing as it invades every corner of our lives.



Mikey Goldweber Past Chair.

As immediate past chair, I get to enjoy a reduced role on the SIGCAS Executive Board. My primary responsibilities focus on SIGCAS's new conference (COMPASS: <https://acmcompass.org/>) and workshop (LIMITS: <http://computingwithinlimits.org/2018/>), in addition to helping out with our list of "in cooperation" conferences and workshops. My personal focus is continuing to be an evangelist for "Computing for Social Good in Education" (CSG-Ed). CSG-Ed is an umbrella term meant to incorporate any educational activity, from small to large, that endeavors to convey and reinforce computing's social relevance and potential for positive societal impact. When one considers what student's life aspirations are and compare them with how we involved with CS education present the discipline, one observes a mismatch. The CSG-Ed movement seeks to address this mismatch since computing, as with all disciplines, should have some focus on the positive role that discipline can play in our world. Any reader interested in learning more about the CSG-Ed movement should contact me via email: mikeyg@xavier.edu



Richard Blumenthal Editor-in-Chief.

My chief responsibilities include managing and overseeing the content produced for the online publication *Computers and Society*. I am a Professor and Chair of the Computer Science Department at Regis University, in Denver Colorado. Part of my responsibilities at Regis include supporting the "Center for Common Good Computing". Recently, I've taken an active role in promoting and supporting "Computing for Social Good in Education", as described by Mikey (above).

LETTER

FROM THE EDITOR

BY RICHARD BLUMENTHAL



Photo: © Richard Blumenthal

“In this state of natural liberty, society will be their first thought. A thousand motives will excite them thereto, the strength of one man is so unequal to his wants, and his mind so unfitted for perpetual solitude, that he is soon obliged to seek assistance and relief of another, who in his turn requires the same” [1].

Welcome to another issue of *ACM Computers and Society*. It is an honor to be the new incoming Editor-in-Chief. As I enter this position, Thomas Paine’s observation on society, quoted above, comes to mind. We all need each other. This includes supporting and contributing to SIGCAS. I’d like to thank Randy, our previous Chief Editor. Without his initial assistance, this issue would never have gotten off the ground. He did warn me, however, that the most difficult aspect of the work was getting people to contribute. This is the minimal assistance I would ask from the SIGCAS membership. Anything else, would be “icing on the cake”.

When I was named the Chief Editor earlier this summer, the publication of this issue was already delayed. I was lucky that Michelle Trim and Douglas Schuler immediately volunteered to contribute regular columns beginning with this issue.

Doug is the SIG’s historian and his article pro-

vides a nice summary of SIGCAS’ birth in controversy. His thought experiment asks, “How would we construct histories that would effectively inform our computers and society work?”

Michelle Trim’s article raises the question “Can computing afford not to see social impacts of its work as central to the discipline?” Her observation that computer scientist might want to follow the lead of Data Science and acknowledge that we should all see ourselves as activists for using computing for the common good. To achieve this she correctly observes that we need assistance from an inclusive and diverse computing society.

Finally, I’ve included an Op-Ed focused on Mark Zuckerberg’s recent position on free expression and the Internet. Personally, I don’t completely support his position, but like the presenter alluded to in Trim’s opinion, I believe Mr. Zuckerberg is being attacked in ways that are not professional. I don’t have a panacea, but I do propose

one way in which computing professionals might judge his positions.

I’d also like to thank José H. Canós for his news on the ISCRAM 2019 conference. It is the Executive Committee’s intention to include similar news about various *Computers and Society* related conferences in subsequent newsletters.

Finally, an additional delay in the publication of this newsletter occurred as a result of a cyber-attack on Regis University. Clearly, the type of behavior that should concern SIGCAS.

Finally, publishing book reviews or short papers here is an ideal way for upcoming scholars and graduate students to begin growing their curriculum vitae and I would encourage our members to recommend *ACM Computers and Society* as a publishing opportunity.

[1] Paine, T. (1776). Common sense. Retrieved September 30, 2019 from <http://www.ushistory.org/paine/commonsense/>.

LETTER

FROM THE CHAIR

BY KARLA CARTER



Photo: Faye Cornish @ <https://unsplash.com/photos/ibqxDGKqIWl>

Hello, SIGCAS members! Greetings from your Chair!

The 1940 movie, *The Great Dictator*, starring Charlie Chaplin, pokes fun at the dictators of that time. There's a [beautiful passage toward the end of the film](#) that remains timeless in terms of technology and its effect on society: "We have developed speed, but we have shut ourselves in. Machinery that gives abundance has left us in want. Our knowledge has made us cynical. Our cleverness, hard and unkind. We think too much and feel too little. More than machinery we need humanity. More than cleverness we need kindness and gentleness. Without these qualities, life will be violent and all will be lost."

If you would, take a moment and ponder what that passage means for 2019 and beyond. Technology has brought us many gifts, but it has its downsides. Thank you for being a part of a group

that wants to promote the good in technology while avoiding the dark side.

One piece of exciting news since last time is welcoming our new Editor-in-Chief, Richard Blumenthal. Richard is a Senior Member of the ACM. He is currently a Professor and Chair of the Computer Science department at Regis University. In 1984, he began his career in the Knowledge Systems Research department at AT&T Bell Laboratories. Prior to joining Regis in 2002, he worked as a Technical Lead and Senior Software Developer at Athene Software and US West Advanced Technologies. Richard holds a B.S., M.S., and Ph.D. in Computer Science from Lock Haven State, Rutgers University, and the University of Colorado Boulder, respectively. He is an active member of the CSG-Education community.

Speaking of CSG-Education, mark your calendars for the continuation of Computing for Social Good in

Computer Science Education (CSG-Education) Pre-Symposium and Special Session events at SIGCSE 2020 in Portland, March 2020, lead by Mikey Goldweber and Lisa Kaczmarczyk. Further details will be forthcoming in our next *Computers and Society* Newsletter.

Keep in mind the updated ACM Code of Ethics, which can be found at <https://ethics.acm.org>. Spread the word! If you have ethical questions or case studies that incorporate use of the Code, contact COPE <https://ethics.acm.org/about/contact-us/> or on Twitter: @acm_ethics.

Last, we all still looking for a new SIGCAS logo, so if anyone has ideas or concepts please send them along. Acceptable vector formats include AI, EPS and SVG.

Come find me on Twitter, @acmsigcas.

I hope everyone has a peaceful holiday season.

MEMBERSHIP BENEFITS

Subscription to the online magazine ACM Computers and Society, which is published three times a year.

Members have access to the full archive of the online publication and its printed predecessor in the ACM DL. Please see www.sigcas.org.

Discounted registration fee for SIGCAS sponsored conferences and workshops. "In cooperation" sponsor of several ACM and non-ACM conferences related to SIGCAS' interests, including LIMITS.

SIGCAS presents two awards each year: The Making a Difference Award and the SIGCAS Outstanding Service award.

SIGCAS-ANNOUNCE mailing list: includes regular announcements of upcoming conferences and calls for participation.

SIGCAS-Talk mailing list to enable member-member interactions and the committee will seek to stimulate discussion on this list amongst members. Subscription to the list is restricted to SIGCAS members and is optional for them.

NEWS

UPCOMING CONFERENCES

2020

Computers, Privacy and Data Protection (CPDP)

January 22-24, 2020 — Brussels, Belgium

The 13th edition of the international conference Computers, Privacy and Data Protection. CPDP offers cutting edge in legal, regulatory, academic and technological development in privacy and data protection.

ACM Conference on Fairness, Accountability, and Transparency (FAT* 2019)

January 27-29, 2020 — Barcelona, Spain

FAT* is an international and interdisciplinary peer-reviewed conference that seeks to publish and present work examining the fairness, accountability, and transparency of algorithmic systems.

Computing for the Social Good in Education (CSG-ED): SIGCSE '20 Pre-Symposium

March 11, 2020 — Portland, Oregon USA

This symposium provides an opportunity for learning technical and professional skills, while reinforcing computing's social relevance. The morning is on Humanitarian Free and Open Source Software (HFOSS) and the afternoon on techniques for incorporating CSG-Ed projects into the computing curricula.

International Conference on Smart Cities and Green ICT Systems (SMARTGREENS)

May 2-4, 2020 — Prague, Czech Republic

The purpose of the 9th International Conference on Smart Cities and Green ICT Systems (SMARTGREENS) is to bring together researchers, designers, developers and practitioners interested in the advances and applications in the field of Smart Cities, Green Information and Communication Technologies, Sustainability, Energy Aware Systems and Technologies.

Sixth Workshop on Computing within Limits (LIMITS 2020)

During ICT4s: June 21-27, 2020 — Bristol, United Kingdom

The LIMITS workshop aims to foster discussion on the impact of present and future ecological, material, energetic, and societal limits on computing. These topics are seldom discussed in contemporary computing research. A key aim of the workshop is to promote innovative, concrete research, potentially of an interdisciplinary nature, that focuses on technologies, critiques, techniques, and contexts for computing within fundamental economic and ecological limits.



BY
DR. JOSÉ H. CANÓS

The 16th edition of the International Conference on Information Systems for Crisis Response and Management (ISCRAM 2019, <https://iscram2019.webs.upv.es>) was held in Valencia (Spain) from May 19 to 22, 2019. The venue was the Nexus building, situated at the centraleast area of the Campus of the Universitat Politècnica de València (UPV). A video recording of the Opening Session can be found at <https://youtu.be/3VY0bDcuSbA>.

The ISCRAM 2019 program was composed of the main conference (held from May 20 to 22) plus five satellite events (4 workshops and the Doctoral Colloquium). The proceedings of the conference can be downloaded from the ISCRAM Digital Library (<http://idl.iscram.org>) and also from the conference Website (<http://bit.ly/2lLmdX9>) The scientific program included three keynote talks from distinguished researchers and practitioners:

- Monday May 20: “Transplantation: the Spanish Model in a World of Challenges”, by Marcos Bruna, PhD MD (Valencia, Spain). A video recording of the talk can be found at <https://youtu.be/EB-VQ6uqTZDU>.
- Tuesday May 21: “Addressing Complexities of Disaster Social Media Analysis”, by Steve Peterson, CEM(r), National Institutes of Health, Bethesda, USA. View it at <https://youtu.be/55FnIYC6pX0>.
- Wednesday May 22: “Making IT Personal: Radically Reflexive Resilience”, by Prof. Dr. Monika Buscher (University of Lancaster, UK). View it at <https://youtu.be/1AaTLletPZic>.

Also, a panel on “Research meets practice” was held on Tuesday 21. Two practitioners, Jennifer Chan, MD (Northwestern University, USA) and Steve Peterson (National Institutes of Health, Bethesda, MD, USA), and two researchers, Dr. Caroline Rizza (Télécom Paristech, Paris, France) and Prof. Dr. Marcos Borges (Federal University of Rio de Janeiro, Department of Computer Sciences, Rio de Janeiro, Brazil) discussed the needs, challenges and opportunities for practice-oriented research. The panel was facilitated by Dr. Valérie November (University Paris, France). You can view the video recording of the panel at <https://youtu.be/fpAwWszgSO0>.

There was a total of 225 registrations to ISCRAM 2019. Registrants came from more than 30 countries from all around the world. Germany (32), the USA (30), France (29), Spain (20), and Norway (12) were the countries with the most registrants.

Overall, the papers were of good to high quality, with Completed Research (CoRe) papers reviewed and edited to a high standard, and Work in Progress papers representing new undertakings and practitioner led (non-academic) submissions were reviewed with a slightly more open approach in order to allow a range of initial project efforts to be described. The reviewing process is overseen by the ISCRAM scientific committee, su-

pervised by track chairs with appropriate scientific credentials, and reviewers from academia and industry. Prof. Dr. José H. Canós, from the Universitat Politècnica de València, Spain) led the Organization Committee, and Prof. Dr. Dr. José J. González (University of Agder, Norway) and Dr. Zeno Franco (Medical College of Wisconsin, USA) acted as Program co-Chairs.

The scientific program was completed with a complete social program which included a welcoming reception on Sunday 19, a Paella Workshop on Monday 20, and the gala dinner on Tuesday 21



HISTORY AND THE SOCIAL RESPONSIBILITY OF COMPUTING PROFESSIONALS

BY
DOUGLAS SCHULER

Keywords: Social Responsibility,

Categories: Social and professional topics → Professional Topics → History of Computing

There is nothing unusual or sinister in the fact that each generation rewrites history to suit its own needs, or about disagreements within the profession and among the public at large about how history should best be taught and studied.

— Eric Foner, *Who owns history?: rethinking the past in a changing world*. 2002. p. xi [2]

History's in the Past — Or is it?

I'm not young now but I was only 13 or 14 when the predecessor to SIGCAS, the Special Interest Committee on the Social Implications of Computing (SICSIC), was formed within the Association for Computing Machinery (ACM) in 1966. According to Janet Toland writing in her article on "SIGCAS in the Early Days" [5] the SIC was initiated to "cover topics such as privacy, the possible consequences of fourth generation languages, and computers in education. Government policies and industrial policies pertinent to the area were to be considered as was the university training of young computer professionals to ensure that they were capable of exercising their responsibilities as regards the social implications of their work."

Not unlike the actions of today's tech employees at Amazon, Google, and Facebook, who recently demonstrated against their employers' practices, early SIC members expressed dissatisfaction with some of the uses to which their skills and products were applied. At that time, the Vietnam War loomed large and they wanted no part of what they believed to be an illegal and immoral war. Less prominent perhaps, but certainly prescient given today's realities, were other concerns, such as surveillance, the involvement of citizens who were non-professionals in decisions about computing, and the education of computer professionals. The group was not large, perhaps 100 members or so, but they became energized when the president of ACM dissolved the SIC in 1968 "due to lack of interest" [5]. Robert Bigelow, who later became the first chair of SIGCAS, organized a petition drive to save "the only group in the ACM through which a member can show he cares about the interface of the computer industry with the rest of the world." Soon after that campaign the ACM agreed to establish SIGCAS, similar to SIC but with some of the earlier mission statements omitted. Interestingly "The management of the SIC was appointed by ACM rather than elected by the SIC members, and an advisory panel of ACM-approved advisors was established." ACM at that time also put limits on the votes of non-ACM members of the SIG but, "By 1975 the ACM Executive Council felt confident enough to allow SIGCAS to elect its own officers, though the first elections weren't actually held until 1979" [5].

Thus SIGCAS was born amidst controversy. Now with the mission to "provide a forum to discuss, debate and research all issues pertaining to the social implications of computing, including ethical and philosophical concerns, for the computing profession" SIGCAS may be the only SIG within ACM that is explicitly expected to produce critique. And the work of the SIG, if done correctly, will undoubtedly invite controversy.

Considering a Useful History of Computers and Society

In my new post as the Historian of SIGCAS I'm eager to participate in our mission and hopefully be of some use informing our work as we move forward. I have been thinking about how this might unfold and I thought I'd explore some issues related to the intersection of history, computers, and society, issues that raise more questions than they answer. The problem is that the issues surrounding computers and society are deep and hopelessly entangled. To make matters worse, matters continue to get worse. At least that's one commonly held belief.

I've been engaged as a researcher, technologist, educator, and activist in computing and society issues since the mid-eighties. I am excited about the prospects of working with SIGCAS members and others on historical aspects of this theme — and what it could mean in terms of future collaborative work. I'm planning to focus on the opportunities and challenges of computing in society, especially as they have evolved over time and how they relate to social responsibility, then, now, and into the future. I see SIGCAS as an important link between the research and development of computing systems and their deployment and how they play out within social contexts. This is particularly important today when these systems have become more deeply embedded — and powerful — in daily life. The systems in fact are establishing in many ways new social trajectories and rearranging and disrupting many established social arrangements.

The question of use may not be the first question that comes to mind when considering the history of computers and society. But, of course, we'd never consider the issue at all if it were totally useless.

It turns out that history has many uses and they tend not to have distinct boundaries. For one thing it must be acknowledged that any history is incomplete: It's curated, cut and pasted from the past onto the present. It's also ultimately a cultural creation and thus subject to the vagaries of the author and to the audience and the circumstances of the era as to what it means — as Foner's quotation at the beginning of this article attests.

Some people think that history is an ordered collection of facts, a book-keeper's approach: This event happened on this date and then another thing happened on another date and so on. But of course this leaves out almost everything of interest. Some people use history for nostalgic purposes: looking at the past in order to be in the past, to relive it, to escape to it, longing for a past, often an imperfect and imaginary version, a kind of spiritual salve or entertainment. Another use of the past is presented in utilitarian terms. We consult history according to the oft-quoted jeremiad about not repeating

the mistakes of the past. But, as we know, there is no agreement on what a mistake is: Different people for different reasons read history differently.

Good history is of course based on evidence and on reason. But because history is ultimately interpretive; it's social. It can be weaponized — and often is. It can dictate who is important, what has happened and why it's imperative that we know it. The words of O'Brien, a highly-placed functionary within the inner sanctum of a dystopian society, in George Orwell's classic novel, 1984, eloquently captures the potential for oppressive or propagandistic histories: "Who controls the past controls the future. Who controls the present controls the past." The campaign slogan, Make America Great Again, used by now President Donald Trump, conjures up the idea of an America that was once great but currently falls short. It's inherently nostalgic but there is also a whiff of foreboding. We're not exactly certain what time it was in our past where everything was great. Nor is it clear for whom that past time was great. And there's this ambiguity about what great means exactly. It would be interesting to know how various people interpret that particular string of four words. Not to put too much weight on one campaign slogan, but it raises interesting questions about who we think we are and where we think we ought to be going. For one thing it suggests that not only do we not talk about non-great events in US history but they just didn't happen. Foner relates the fact that "Proposed national standards for the teaching of history were denounced by critics like Lynne Cheney, former head of the National Endowment for the Humanities, for devoting too much attention to obscure members of minority groups, slighting more prominent American leaders, and offering a "depressing" account of the nation's development."

The tendency for people with more power to create the picture of how the past is to be perceived is captured simply by the expression "History is written by the victors." In our field, in 2019, we basically know who the victors are: Many have benefited greatly from computing technology while others have benefited mightily: Take a look at the list of billionaires in the world and how their wealth was accumulated. Less is known about the people whose main connection to modern information technology is that the data about them requires some space in the cloud and is used in algorithms that are totally invisible to them that make decisions about their future [1]. Not to mention that anybody who is killed by a drone is also a "user" of computing systems.

As SIGCAS members and as members of the professional computing industry we are more generally victors than victims. But as professionals and concerned individuals we are tasked with the vital responsibility to help give voice to people who are most affected adversely by computer systems. This often includes the economically disadvantaged, people of color, indigenous people, minority populations, people with disability, children and others.

William Cronon, a professor who looks at various aspects of US history, presents a rich example from environmental history, that helps illustrate important points that may help us think about our computers and technology domain. The first time that he taught environmental history of the US he was alarmed to learn that his lectures had a paralyzing effect on his students. Student evaluations of the class revealed that "the vast majority seemed profoundly depressed by what they learned." The consensus view was apparently that the environment in the US had "gone from good to bad" and that there was "little or no hope for the future." Cronon's own opinions on the subject were not so bleak and he used his "secular pulpit" to end the term on a "deliberately upbeat note" with personal reflections and lessons that he had learned.

Cronon's essay reveals several important issues about any historical explorations we may embark upon. One of them is whether or not there is a responsibility to be positive. We don't want to intentionally dumb ourselves down by sugarcoating the history of computers and society. That would

prevent social critique and diagnostics and encourage us to "repeat the mistakes of the past." But paralysis is also a nonproductive mindset. Beyond that we also wonder if there is a responsibility to provide conclusions, however tentative. Can't people figure out what something means by themselves? And what about recommendations? Is there any obligation to promote actions that readers might take or, on the other hand, is there an obligation to remain silent?

Cronon's discussion of who the audience for history of the environment is, was informative to me as a non-professional historian. After reviewing several candidates Cronon determined that the environment itself is ultimately the most important "user" of the history of the environment. From our perspective as humans who routinely interact with — and influence — the environment and are at the same time part of the environment, Cronon's conclusion suggests that the histories of the environment that we create and read, should help us think productively about our relationship with the environment.

At least as a thought experiment we might wonder how this approach might apply to our field. How would we construct histories that would effectively inform our computers and society work? How useful would it be to think of technological systems as constituting some sort of environment? Ultimately "users" of that sort of history help us think in terms of rights and responsibilities in relation to that dynamic environment.

Making History

Santayana's aphorism "Those who cannot remember the past are condemned to repeat it" [4] captures the contemplative side of history (where "study" is often substituted for "remember" when reciting) while Laurel Thatcher Ulrich's quote "well-behaved women seldom make history" [6] exemplifies the active side. (Although her argument was not that women should necessarily misbehave. Many women throughout history though denied acknowledgment in history books, did, through the keeping of diaries, letter writing etc. also make history.)

Diaries and other personal histories can not only be a part of history but can also become history. When the product is technology it becomes history as well, directly (yet often invisibly), as it becomes integrated into the lives of people, often with unforeseen consequences. This poses special challenges for people in the general public as well as those who are striving to understand and manage these consequences responsibly.

Much of the work that SIGCAS members do is historic in that their work both helps to document our era and its increasing reliance on — and obedience to — technology and to help us think about its role not just as seen the rear-view mirror but as a partial guide as we careen into the largely unknown and always surprising future.

One of the services that histories of computers and society could help provide is identifying salient factors and issues that illuminate the relationship between computers and society — how they have influenced each other in the past and how they might yet do so in the future. Users of these histories will then presumably consider this history and make decisions in the here and now that could ultimately prove consequential in coming events. One of the time-honored ways to do this is to review and analyze critical projects and endeavors and decisions of the past. One of the most pertinent to SIGCAS is the transfer of the Internet to private concerns in the early 1990s. Obviously this is one of the most (if not the most) significant events in the ongoing story of computers and society. In fact, quite possibly it helps determine the directions of modern global history. At any rate, the decisions were not public. The taxpayers who funded it were not involved, nor was it ever put up to any sort of vote. Yet we know that some people and organizations were tasked with the chore of laying the groundwork for what the Internet would become. All of us are now directly drawn into that system — with its rules and rulers, norms and expectations, as well as its technological affordances — which will

shape and influence how humans communicate for years to come.

Our unique perspective may allow us to see the danger signs of technology misuse more directly: We can more readily imagine, for example, how to actually build a mass surveillance system. Although others may disagree I see this as a fundamental service that SIGCAS could help provide. Delving into history actually encourages us to acknowledge the broad areas in which we have influence and our awesome social responsibility which is more critical than ever before. At the same time we also realize that there are limits to our influence which behooves us to envision our role as one among many. Computer professionals must be active discussants in the broader community worldwide. This should include collaboration with other professional associations in technology and outside of technology. These groups potentially know more about particular issues but computers draw many of the issues together and enable / cause them. In a legitimate pursuit of social responsibility related to computing we in SIGCAS will need to face — and even help shape — strong critiques of these powerful players.

Computer scientists have unique roles to play but there are also important caveats. As computer scientists whose interests and livelihoods revolve around computing, we may underestimate the threats, assume they will go away on their own, or believe or hope that somebody else will take care of them. For that reason and many others we have the responsibility to have give voice to credible critics of computing deployment. If computer scientists speak only among themselves or are encouraged to think they have the authoritative perspective they may not respect people or approaches with differing perspectives. The hubris of computer professionals and corporations — at least some of them — can be remarkable. Some number of them feel obliged and informed enough, for example, to advocate for wholesale “transformation” of the schools, democratic processes, the economy, etc. based on the hazy and uncertain promise of the next-generation technology. Far-fetched claims are legion and represent a somewhat one-sided public marketing blitz against a somewhat naive public.

We not only need to collaborate in our work to prevent damage to the social fabric (fake news, surveillance, etc.) but to help pursue solutions to the vast problems that face us including social exclusion, economic injustice, environmental degradation and climate change, and many others. This work could include supporting the development of new public deliberation platforms or non-surveilled public media. And these in turn could be used to help various communities around the world put together and manage their own versions of a Green New Deal, for example, in which the climate and environmental problems could be addressed simultaneously with the addressing of social problems [3].

In addition to facing already existing threats, due to the speed and the possibly immense effects of digital systems we must also look ahead with an eye towards impending disruptive issues (possibly relating to privacy, body and brain interventions, media and cultural ecosystem, norms, identity, employment, power, land use and misuse, among others). To this end we could convene, participate in, or help facilitate citizen boards, participatory technology assessment, workshops, forums, and other activities that further understanding of computing in society and the issues we face.

In 1969 New York based members of SICSIC wrote a strongly worded article published in *Interrupt*, the newsletter of Computer Professionals for Peace in 1969. The authors claimed that the proposed dissolution of SICSIC: “effectively demolishes the ACM’s pretense of professional neutrality” [6]. The article was entitled, “On the Social Implications of Computers” and ended with a resolution. The recommendation that all computer professionals should “review the moral consequences of their involvement in furthering” the war in Vietnam was prominent. They also voiced their opposition to “the establishment of mass data banks which pose a threat to our privacy and con-

centrate power in the hands of a few.” They did however acknowledge the potential for socially ameliorative technology and expressed “support the active encouragement, development, and funding of programs for the constructive application of computers toward the solution of the many problems faced by our society.” One of the original aims was assembling an online resource guide, a modest enough proposal. What proposals might emerge from our work today? How might SIGCAS organize or mobilize itself to better address its stated aims? How might we make history in the next era?

This is the first of several essays on History and the Social Responsibility of Computer Professionals for the SIGCAS Newsletter.

References

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EDGE COMPUTING SOCIETAL PRIVACY AND SECURITY ISSUES

BY

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Keywords: Edge Computing, Cloud Computing, Internet-of-Things (IoT)

Categories: Social and professional topics → Computing / Technology Policy

Abstract

Edge computing involves pushing data storage, processing and analyzing to the edges of a network. It allows for actions to be taken at the point of processing. Edge computing is forcing change, and impacting society with its privacy and security issues, due to the way information is sent, is stored, and in the way, people react to the changes. This is due to the fact that data can be analyzed and reported in real time, so its outcomes are immediately actionable.

From the start of the industry, the focal point for business computer processing and services has swung back and forth between periods of centralization and distribution. For example, the early mainframe era was centralized, while the succeeding desktop era was largely decentralized. In the current cloud computing model, data and networks are once more largely centralized, with storage, processing, management, and other services provided by remote servers connected via the Internet.

With the current cloud computing model, data and networks are largely centralized, with data moving from the edges of a network to the center or cloud. Edge computing is different in that it involves pushing data storage, processing and analyzing to the “edges”, or remote parts, of a network. An “edge device” can be many different things, ex., a smartphone, an ATM, high-way sensors, or Internet of Things (IoT) products. It allows for actions to be taken on-site, at the point of processing. Data can be analyzed and reported in real time, so its outcomes are immediately actionable for decision makers. Edge computing is forcing change, both in the way information is sent or stored and in the way people interact. Business models will need to change in order to adapt to this high-technology, decentralized marketplace [8].

Current State of Edge Computing

One example of the benefits of edge computing is the Boeing 787. Boeing estimates that the 787 generates about 5 gigabytes of actionable data per second while in flight. All this data must be processed in real time if the aircraft is to operate properly. However, the bandwidth between the airplane and either a relay satellite or a ground base station is not large enough to handle that level of data transmission. Handling this data requires real-time processing in-flight for the 787 to make correct decisions and adjustments. If all the data needed had to be sent to the cloud for processing, the response time would be too slow. The current network bandwidth and reliability would be significantly stressed if the cloud was trying to support a number of 787's in close proximity. Edge computing equipment and software on the aircraft meet this challenge [1].

A major societal problem exists in that computing and IP-based networking technologies are being embedded into many types of new devices or systems that were previously unconnected. Connectivity and automated Intelligence are becoming standard features in cars, appliances, industrial control and consumer electronics. The key problem is that the ever-increasing amount of data that these systems are generating can overburden existing networks. Processing some of that data locally or at the edge, can significantly reduce

the amount of data that must be sent over a WAN to a central data center or cloud and alleviate network traffic bottlenecks, as well as application performance concerns [3]. This raises the issue of how to protect data at the edge

Privacy and Security Issues

Many executives feel that at the edge of the network, user privacy and data security protection are some of the most important services that should be provided., and that how to support service without harming privacy is a challenge. To protect the data security and usage privacy at the edge of the network, several challenges remain open.

One is the awareness of privacy and security to the community. All the stakeholders including service provider, system and application developer, and end user need to be aware that the users' privacy can be harmed without notice, at the edge of the network.

Another issue is the ownership of the data collected from the edge. The data of end users collected by applications is often stored and analyzed at the service provider side. It would be better to leave the data at the edge where it is collected and let the user fully own the data. That would be a better solution in terms of both security and privacy. During the process of authorization, highly private data could also be removed by the application to further protect user privacy. At this point, systems are missing some efficient tools to protect data privacy and security at the edge of the network. The same highly dynamic environment at the edge of the network also makes it easier for the network to become vulnerable or unprotected. It is clear that more tools are needed to handle diverse data attributes utilized in edge computing [4].

Edge Computing and Autonomous Vehicles

One of the most significant impacts edge computing is going to have on society is through its use with autonomous vehicles. It is estimated that a single autonomous vehicle will produce 30 terabytes of data in a single day [7]. Ten million autonomous vehicles are expected to be on the road in the US alone in the next few years, and the amount of data they will generate will be immense. Much of this data will be unstructured and will need to be run through powerful analytics programs to produce actionable data to enable them to safely navigate the road. Government agencies and automotive manufacturers must create new standards. It is going to be critical to regulate what data needs to remain on the edge to be processed by the vehicle's onboard computing power and what data should be dispatched to the cloud for analysis [5].

Those vehicles will need to be in constant communication with the world

around them, making split second decisions based upon the data they receive. No communication will be more important, however, than the machine to machine (M2M) communication between an autonomous vehicle and the other vehicles on the road. Much of this data will be able to be sent and received between the vehicles themselves, without requiring them to interface with distant cloud servers. This communication effectively turns every vehicle on the highway into an extension of every other vehicle's sensors, providing the best information possible. Edge computing offers the only real solution to the problem that even a few milliseconds of delay between vehicles can result in an accident and catastrophic loss of life [5].

A Leading Corporation's Predications

Cisco management believes that by the end of 2019, data produced by people, machines, and things will reach 500 zettabytes. They also believe that at time, 45% of IoT-Created data will be stored, processed, analyzed, and acted upon close to, or at the edge of, the network]. They predict that there will be 50 billion things connected to the Internet by 2020, and many of those applications will require very short response time.

Furthermore, as the explosion of connected lightweight devices starts the era of the Internet-of-Things (IoT), cloud computing is facing increasing difficulty to meet the data computing and intelligent service demands of IoT devices and applications. Moving the data computation and service supply from the cloud to the edge enables the possibility of meeting application delay requirements, improves the scalability and energy efficiency of lightweight IoT devices, provides contextual information processing, and mitigates the traffic burdens of the backbone network. Cisco believes that cloud computing is not efficient enough to support these applications. With the growing quantity of data generated at the edge, speed of data transportation is becoming the bottleneck for the cloud-based computing paradigm [2].

Many Challenges Remain

Data storage, computing and control can be separated and intelligently distributed among the connected edge servers and IoT devices. Thus, edge computing can bring many beneficial advantages, such as, highly-improved scalability by remote and intelligent service supply, and local computing that makes full use of client computing capabilities. However, to truly realize edge computing in IoT applications, other issues must be addressed. For example, most IoT devices communicate via wireless and mobile links, leading to the inherent disadvantage of unstable and intermittent data transmission.

Moving data, computation and control into the cloud has been a significant trend in the past decade. However, as the explosion of connected lightweight devices starts the era of the Internet-of-Things (IoT), cloud computing is facing increasing difficulty to meet the data computing and intelligent service demands of IoT devices and applications. Moving the data computation and service supply from the cloud to the edge enables the possibility of meeting application delay requirements, improves the scalability and energy efficiency of lightweight IoT devices, provides contextual information processing, and mitigates the traffic burdens of the backbone network [4].

Moreover, how to efficiently distribute and manage data storage and computing, how to make edge computing collaborate with cloud computing for more scalable services, as well as how to secure the whole system, are significant challenges impeding the development and implementation of edge computing for IoT. Reliability is also a key challenge at the Edge of the network. One can identify the challenges in reliability from the different views of service, system, and data. From the service point of view, it is sometimes very hard to identify the reason for a service failure. At the Edge of the network, it is not enough to just maintain a current service when some nodes lose connection, but to provide the action after node failure makes more sense to the user [6].

Final Comments

More and more services are being pushed from the cloud to the edge of the network due to the fact that processing data at the edge should ensure shorter response time and better reliability. Another key point is that bandwidth can be saved if a larger portion of data can be handled at the edge rather than uploaded to the cloud. The burgeoning of IoT and the universalized mobile devices use by society have changed the role of computing. The edge computing paradigm has changed users from data consumers to data producer/consumers, because it is more efficient to process and message data at the edge of the network than in the cloud.

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COMPUTING'S SOCIAL OBLIGATION

BY
MICHELLE TRIM

Keywords: Computing, Social Obligation, Ethics, Diversity

Categories: Social and professional topics - Computing / technology policy

The cover of the August issue of *Communications of the ACM* showcases Harvard's impressive experiment integrating ethics throughout its undergraduate computer science curriculum [6]. Anyone currently grappling with exploding enrollments must applaud Harvard's deliberate use of resources to broaden CS education beyond its traditional technical components. In a similar vein, ACM recently updated its professional code of ethics, calling on CS professionals to acknowledge "all people are stakeholders" and to "ensure that the public good is the central concern during all professional computing work," [1] possibly adding to the pressure many in CS education may be feeling to 'up their game' when it comes to their programs' attention to ethics. Unsurprisingly, doing ethics in CS can seem like yet another requirement tasked to an already overburdened system. If one is operating under constraints, perhaps limited by shortages in money and personnel, ethics, or put another way, instilling concern for computing's impact on society, starts to seem like a luxury: something that we all agree is valuable and that would be nice to have if we can afford it. But, what happens if learning about ethics is just as fundamental to software engineering as procedural abstraction or just as crucial to data science as learning to avoid spurious correlation?

In 2018, a presenter at Artificial Intelligence, Ethics, and Society (AIES) was taken by surprise when audience members asked about possible ethical implications of their partially generative algorithm, which was a key component of a gang-related-crime labeling software. His response, "I'm just an engineer," went viral [8]. Reading about the avalanche of criticism that followed, I admit that I felt a bit sorry for the presenter. I think he saw himself as mostly doing computer science, which can feel objective and compartmentalized away from social concerns, a lot like doing math. Colleges and schools often rely on the humanities to teach people about what it means to be human, to understand the place of the individual within society. It isn't that unusual to encounter in the world people who believe disciplines like math or computing and the humanities are almost mutually exclusive in shaping expertise. Given this established binary, it somehow feels almost socially acceptable to give this poor guy, whose expertise looks a lot more like math, a break.

Meanwhile, automotive consumers come to grips with learning that a longstanding company has been programming their cars with cheating software [7], misleading emissions testers about the amount of pollution being put back into the air [12]. Rather than being just a transgression of some perceived red-tape regulation, this deceptive work-around resulted in EPA estimates of 35 times more pollution entering the air than the allowable standard. In the United States, Facebook users learned that their personal data was obtained by Cambridge Analytica in a breach that captured even the attention of the U.S. legislature [4]. Questions of privacy, personal data exposure, and even consumers' ability to know and control what data about them is being collected are now part of mainstream media discussions of tech companies' obligations for transparency in using customer data [2]. Writers like Cathy O'Neil [10] and Virginia Eubanks [3] have published exhaustively researched exposés on decision-making software that has separated children

from families, prevented the needy from receiving their welfare support, affected access to housing, and enacted racist policing models. In these cases, it is not dramatic to state that human lives depend on the fairness, accuracy and transparency of these computing systems.

Ben Green, Affiliate at the Berkman Klein Center for Internet & Society at Harvard, argues that all data scientists must see themselves as activists [5]; this suggests that expertise in math and the implementation of algorithms as being exempt from social concerns is quickly becoming an archaism. In fact, the National Science Foundation's (NSF) Directorate for Computer and Information Science and Engineering (CISE) has begun requiring approved Broadening Participation in Computing (BPC) plans as part of each funded project for many of its core research programs [9]. This requirement has put pressure on many CS researchers who historically have eschewed worrying about broadening participation efforts as problems better left to sociologists and others interested in broad societal concerns. If computing educators, researchers, and professionals have only been trained to do computing, then how can we as a field provide the next generation with the training they will need to be more than 'just engineers?' Once the responsibility for that education is accepted, a next step might be to reach out to those in the academy, in the profession, and in education who have the expertise we need. We can partner with them, co-teach with them, co-author and co-research. We can add more voices and more diverse backgrounds to those that sit on our curriculum and planning committees, and we can welcome those with different perspectives into our sacred disciplinary spaces.

And, it is this act of welcoming that brings me back to the cover of that recent issue of the *Communications of the ACM*. The classically stylized image of Socrates possibly evokes thoughts of philosophy, of ancient Greece, and of what some regard as the central disciplinary home for ethics. Since Harvard's project involved the integration of philosophy into their CS courses [6], I can understand why this cover made sense. However, perhaps it is also worth reflecting that in a time when computing is working so diligently as a field to broaden its appeal and to welcome women, people of color, and people from other disciplinary traditions, that this cover could also reference a time and place of extreme tyranny. A time and place when women – all women – had no rights at all, when slavery was legal, and when only an elite few made decisions that governed everybody. A classical definition of ethics is not enough to serve computing now, nor is it compatible with the inclusiveness and diversity required for CS to be representative of the society it impacts. Indeed, the article describing the difficult work Harvard has undertaken emphasizes the necessity of incorporating other voices, ending with a call for readers to share ethics resources in order to improve and grow their existing repository.

Can computing afford not to see social impacts of its work as central to the discipline? Just as Green argues for data science, those doing computer science are building the world, and thus have a responsibility to the society absorbing the impacts of their actions. That responsibility requires an attention to more than just classical ethics; it requires an active and purposeful outreach into communities previously un(der)represented within computing.

As increasingly sophisticated and inscrutable decision making systems continue to take up roles within our civic lives, we must recognize that “those machines will then face an age-old problem of moral philosophy: how to” equitably “apportion benefits and costs among different individuals with conflicting desires” [11]. Adding that attention to equity cannot be achieved through reason and logic alone; it requires that we go out of our way to incorporate the concerns, desires and needs of people who may be very different from us. That kind of outreach also demands exposure to lessons in how discrimination gets inscribed into systems and society. Only through relentlessly inclusive and diversity positive actions will computer science truly be for the common good.

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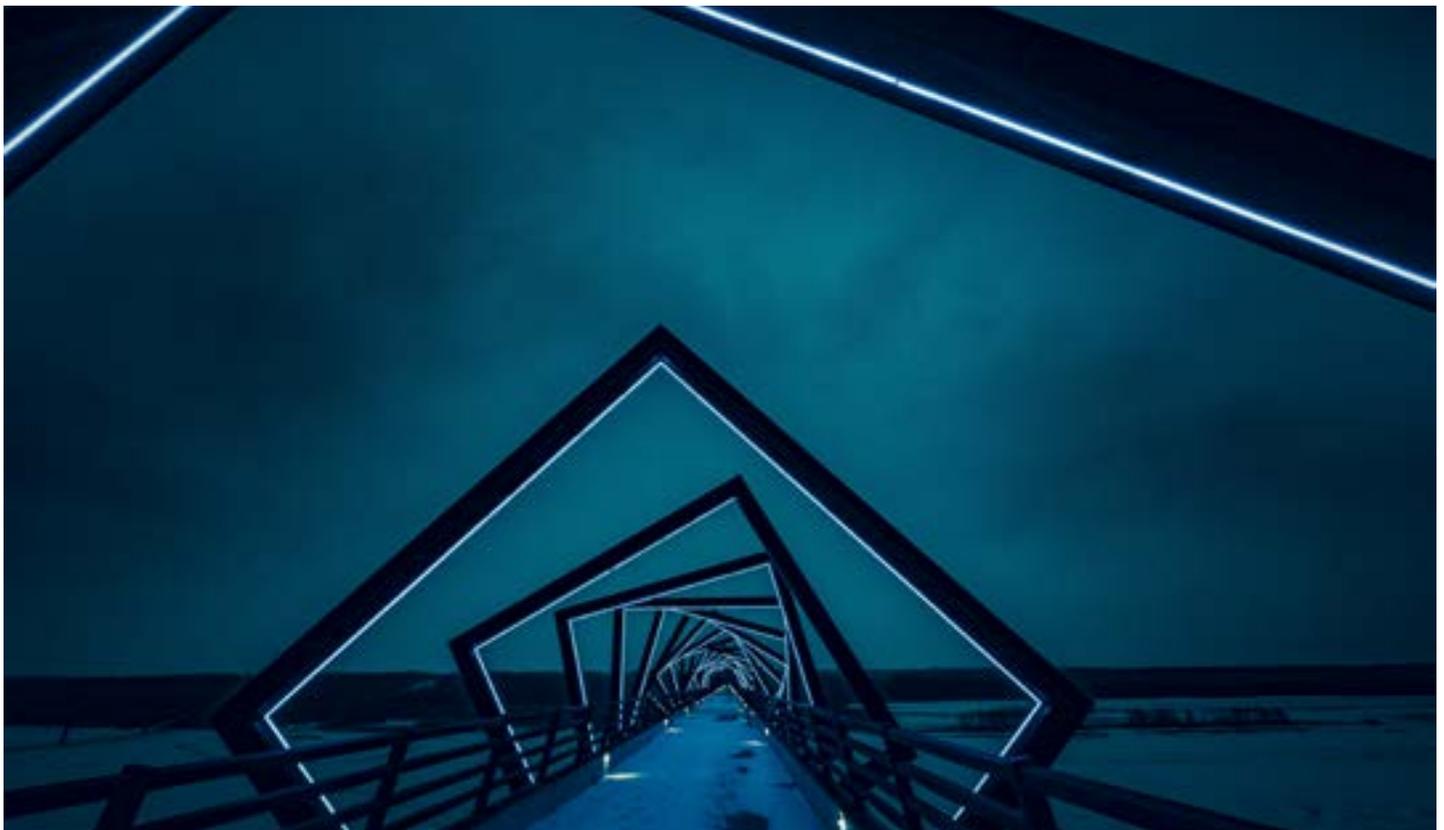


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RESPONSIBILITY, WHAT'S APPROPRIATE?

BY RICHARD BLUMENTHAL

Keywords: Free Expression, Social Media, Internet Platforms, The ACM Code

Categories: Social and professional topics - Computing / technology policy

*“Thus SIGCAS was born amidst controversy...
And the work of the SIG, if done correctly,
will undoubtedly invite controversy.”¹*

Whether intentional, Mark Zuckerberg’s, Chief Executive Officer of Facebook, position on free expression and Internet platforms has undoubtedly invited controversy. As Mr. Zuckerberg is a recognized leading computing professional, I applaud him for taking a stand and “addressing concerns and raising awareness about the ethical and society impact of computers”, which is the defined scope of SIGCAS’ specialty [2]. As Editor-in-Chief, it is my honor to extend Mr. Zuckerberg an invitation to engage the SIGCAS community by contributing to *Computers and Society*, especially as our membership raises any concerns on his position. I understand Facebook is a commercial entity, but together “all people are stakeholders in computing” [1].

Let me summarize the controversy to which I’m alluding. In a recent speech at Georgetown University [6], Mr Zuckerberg expressed Facebook’s position with respect to free expression and Internet platforms including his justification for this position. Specifically, he stated that Facebook provides an important “... service to do two things: give people voice, and bring people together” and that “... we don’t fact-check political ads. We don’t do this to help politicians, but because we think people should be able to see for themselves what politicians are saying” [6]. Instead, Facebook verifies the authenticity of the speaker. The controversy stems from postings that Mr. Zuckerberg identifies as “misinformation”, but others have identified as outright lies, “propaganda” and, with respect to Facebook, a “disinformation-for-profit machine”, as reported in the New York Times [3].

Lest I inaccurately characterize Mr. Zuckerberg’s position, I encourage everyone to decide for themselves by reading his speech [3]. I’d also encourage reading his critics’ positions and his testimony in the U.S. Congress [3, 4, 5]. Having done so, I invite the SIGCAS membership to appropriately comment and thus, support our SIG’s purpose, which includes “collecting and disseminating information through our online publication of *Computers and Society*” [2]. Naturally, these invitations raise questions as to what might be considered appropriate commentary, that is, free expression? As this is an Opinion column, I have a few thoughts that I hope will inspire further discussion.

Controversy surrounding free expression is not new, but Facebook’s position on reporting misinformation based “on the authenticity of the speaker rather than the content itself” appears to diverge from similar positions taken by other “media” companies, at least in the United States. I don’t know whether Mr. Zuckerberg is a member of the ACM or SIGCAS. If not, I might ask why not? As computing professionals, and certainly as members of ACM, the Compliance section of the ACM Code of Ethics and Professional Conduct (“The Code”) states that “A computing professional should ... (4.1) uphold, promote, and respect the principles of the Code and (4.2) treat violations of the Code as inconsistent with membership in the ACM” [1].

In a Letter from the ACM President introducing the Code, she states “computing professionals also are the first line of defense against the misuse of technology” [1]. She goes on to note that “The ACM Code of Ethics is designed to help guide the aspirations of all computing professionals in doing our work. It acknowledges that ethical decisions are not always easily arrived

at, and exhorts us, as professionals, to develop not only our technical abilities but our skills in ethical analysis as well” [1]. The Code states that “... computing professionals should follow generally accepted best practices unless there is a compelling ethical reason to do otherwise”. With this intent, I’d argue that the Code provides a framework for judging how we might evaluate Facebook’s position on free expression and decide what is appropriate and expected as computing professionals.

More specifically, how is a given position, such as Mr. Zuckerberg’s, aligned with, or not, the Code? Principles in the Code that immediately come to mind are found in the General Ethical Principles section, which states “A computing professional should...

1.1 Contribute to society and to human well-being, acknowledging that all people are stakeholders in computing,

1.2 Avoid harm.

1.3 Be honest and trustworthy,

1.4 Be fair and take action not to discriminate”.

As Mr. Zuckerberg’s speech addresses these principles, at least indirectly, we should assume he believes that he is aligned with them. Though, as he stated “where do you draw the line?”. As an example, the Code explains what “harm” means and includes “unjustified physical or mental injury”. Mr. Zuckerberg addresses removing content that promotes “imminent physical harm”, but appears to ignore mental injury. Point being, Facebook is making judgments. Difficult ones, albeit, that deserve an inclusive and diverse societal dialogue, which should include the SIGCAS community.

Mr. Zuckerberg further states, “And while I worry about an erosion of truth, I don’t think most people want to live in a world where you can only post things that technology companies judge to be 100% true” [6]. As with any commercial business, “The Court of Public Opinion” will certainly judge Facebook, which in a democracy includes the codified laws representing society. It is my opinion that computing professionals should influence this opinion based on the principles and responsibilities found in the Code. If the Code doesn’t serve us, perhaps we need to reexamine it once again.

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¹This quote appears in Douglas Schuler’s article earlier in this issue.

NEWS

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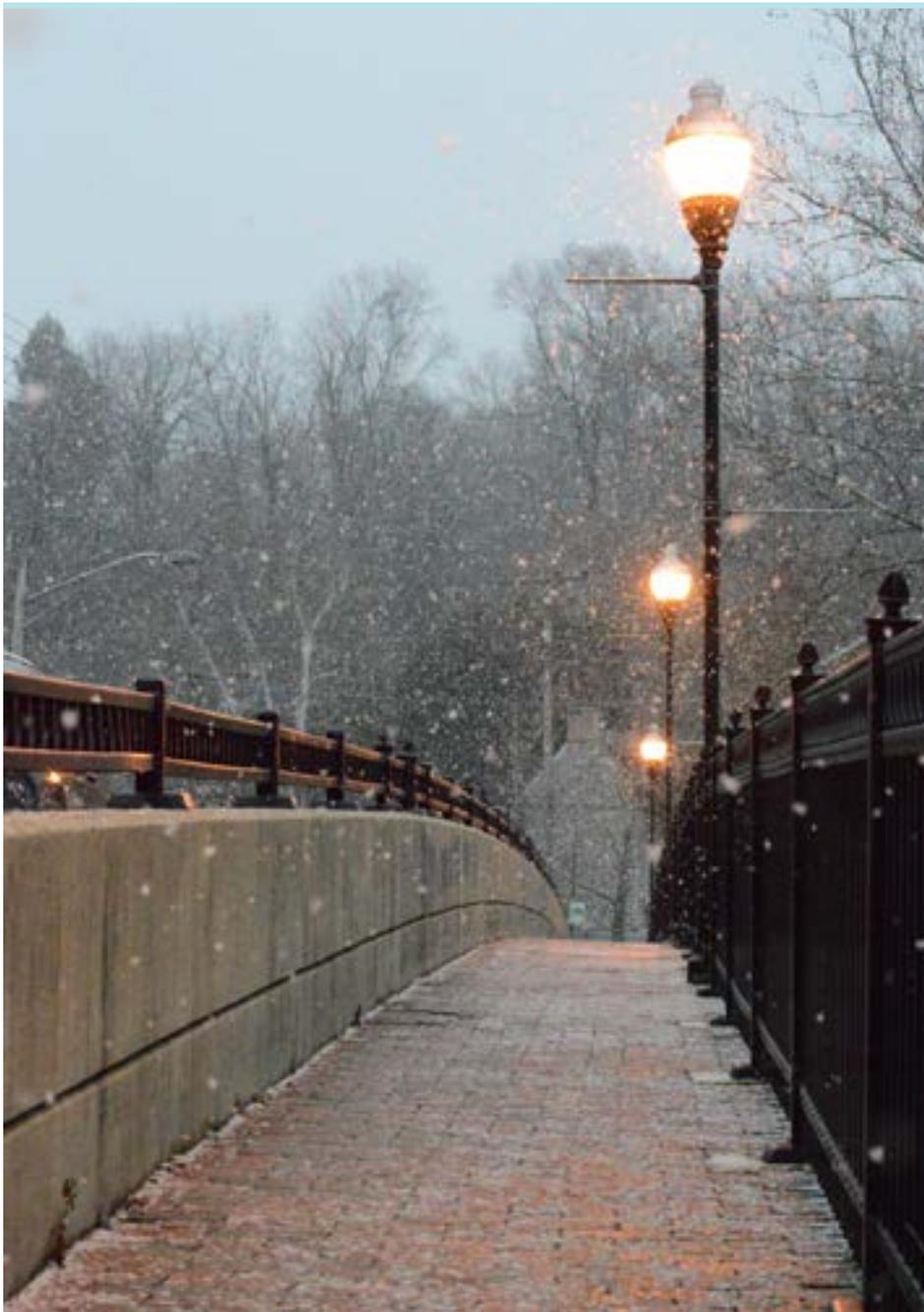


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