

ACM SIGCAS COMPUTERS and SOCIETY

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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

INTRODUCING THE SIGCAS EXECUTIVE COMMITTEE



Doug Schuler - SIGCAS Chair.

My first job as the new SIGCAS Chair is to introduce myself and the other new board members: Lisa Kaczmarczyk, Vice-Chair; and Alison Clear, Member-at-Large, to the SIGCAS community. The three of us will be joining Mikey Goldweber, Past President, and Richard Blumenthal, Editor-in-Chief of *Computers and Society*, to form the SIGCAS Executive Committee.

I have been working in the field of computers and society for over 35 years, as an educator, researcher, developer, author, speaker, and organizer. I have written numerous articles, books, and chapters on this topic, which I won't list here. I worked with the practical side with others to establish the Seattle Community Network in the late 80's and I've had the good fortune to discuss these topics with colleagues from around the world. I'm now retired from teaching at the Evergreen State College, developing CSCW software at Boeing, and campaigning with Computer Professionals for Social Responsibility.

My plan now is to keep active for the foreseeable future to help keep the opportunities and challenges presented by computing visible and to help focus our energy appropriately. In my exploration of civic intelligence, the collective capacity to address significant issues effectively and equitably, I continually asked the question, "Will we be smart enough, soon enough?" which should resonate with this community.



Lisa Kaczmarczyk - Vice Chair.

As Computing for Social Good has been a personal and professional passion my entire career I am very pleased to be the incoming SIGCAS Vice-Chair. I am a strong proponent of collaborative and transparent process and decision making, and as such am looking forward to working with my Board Colleagues as well as with the greater SIGCAS community to prioritize our goals and then act upon them. It isn't about me, it is about us. What can we do to increase the relevance and usefulness of SIGCAS to the membership and society as a whole? I look forward to learning more from the SIGCAS community about how they would answer that question and working with my Board colleagues to respond.



Alison Clear - Member-at-large.

I am very pleased to introduce myself as a newly elected board member, Alison Clear, Associate Professor, at the Auckland campus of the Eastern Institute of Technology. I have an extensive academic and professional career that has involved academic leadership in research, scholarship, teaching and curriculum development and publications nationally and internationally. Many years ago I developed a new course "The Impact of Computing on Society" and it has been offered every year for the past 20 years and is still proving to be one of the most popular courses on our campus. My research interests include Computing Curriculum development, Gender equity in Computing, ICT in developing countries, and the development of computing education. I look forward to working with the SIGCAS community to further the increasingly important work as computing becomes more pervasive and significant in society.



Mikey Goldweber Past Chair.

Hello again to the SIGCAS community. As past SIGCAS Chair, I hope many of you are aware of my passion and commitment to Computing for the Social Good. I left a high paying industry job in the mid-1980's (with the Porsche 911 to prove it) to seek a more personally rewarding career path. I landed in education after earning my PhD. However, I felt that being an educator was not quite enough; I needed to help my students see how computing can and should be used to improve society. Working in this area has taken me many places and afforded me the privilege of meeting many amazing colleagues doing amazing things. It also led me to SIGCAS, and after years of being a member, I stepped up into a leadership position. As the Past-Chair member of the Board I hope to continue offering my insights and time as our SIG moves forward to the challenges of the day.



Richard Blumenthal Editor-in-Chief.

Greetings to the SIGCAS Community. Like Mikey, I also left a lucrative job in industry two decades ago to focus on using my computing knowledge to more directly benefit society. Just the same, I am a relative new comer to SIGCAS. My responsibilities include overseeing the production of SIGCAS *Computers and Society*. I am a Professor and Chair of the Computer and Cyber Sciences Department at Regis University, in Denver Colorado. At Regis, I also contribute to our "Center for Common Good Computing". Recently, I've taken an active role in "Computing for the Social Good in Education". I have a B.S., M.S., and Ph.D. in Computer Science from Lock Haven State, Rutgers University, and the University of Colorado, Boulder, respectively. I am very excited to be working with the new Board and look forward to helping make this the best ACM SIG.

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

CSCW '20: Computer Supported Cooperative Work and Social Computing

January 17-21, 2020 — Virtual Event, USA

The premier venue for research in the design and use of technologies that affect groups, organizations, communities, and networks.

Computers, Privacy and Data Protection (CPDP)

January 27-29, 2021 — Brussels, Belgium

The 14th edition of the international conference on Computers, Privacy, and Data Protection

ACM Conference on Fairness, Accountability, and Transparency (ACM FAccT)

Early March, 2021 — Virtual Event

A computer science conference with a cross-disciplinary focus that brings together researchers and practitioners interested in fairness, accountability, and transparency in socio-technical systems.

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

April 28-30, 2021 — Prague, Czech Republic

The purpose of the 10th 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.

The 7th International Conference on Smart Objects and Technologies for Social Good (GoodTechs 2021)

2021 — Not Finalized

Dedicated to computer science and engineering researchers working with the design, implementation, deployment, operation, and evaluation of smart objects and technologies for the social good.

FROM THE EDITOR

BY RICHARD BLUMENTHAL



Photo: © Richard Blumenthal

Welcome to another issue of ACM SIGCAS *Computers and Society*. As you may be aware, SIGCAS has a new Executive Board. Brief introductions from each of the Board members appears on page three of this issue. This is an exciting time for SIGCAS and as this issue of *Computers and Society* goes to press, the new Board has already met several times to discuss how we can continue to grow and increase the significance of this SIG.

I am both surprised and not surprised with the topical content in this issue. On one hand, my surprise stems from the fact that each of the various contributors, including myself, have independently been motivated to speak to aspects of the Black Lives Matter protests occurring in the United States. On the other hand, it's not surprising that our SIG members, who are specifically attuned to the impact of computing on society, would address an important societal issue and consider how our expertise might be used to support such movements.

In this issue, our Contributing Columnist Doug Schuler, the SIGCAS Historian, shifts to the role SIGCAS Chair with his *From the Chair* column.

I applaud Doug for not simply giving us an up-

date on the SIG and reminding us that beyond our "basic responsibilities that every citizen has, we also have a few more due to our knowledge and influence in an especially significant field".

Sticking with a theme of not being surprised, once again, Michelle Trim delivers a powerful thought provoking column. Like a skilled legal scholar, she steps us through a brief history of essentialism and how it is currently affecting computing practices and computer science in a manner such that we can only conclude that we must question our assumptions and change the way we think as computing professionals, if we ever hope to start to move computing towards anti-racism.

Speaking of legal-style reasoning, Johanna Blumenthal previews her new column "Thinking Like a Lawyer". This column will explore the impact computing has on society from a legal perspective. Given my discussions with colleagues concerning computing and the law, the potential list of topics she highlights in this issue demonstrates that we may all benefit from a broader interdisciplinary approach to examining computers and society.

Kendi's *How to be an Antiracist* inspired my Parting Opinion column's focus on software neu-

trality. Interestingly, this column was written prior to my reading the other columns in this issue and yet, I believe we appear to have a common underlying theme that focuses on questioning various assumptions being made within computing disciplines and how these assumptions relate to racial and gender diversity.

Along the way, this issue also contains two pieces from the Computing for the Social Good in Education (CSG-Ed) community. The first, *Diversity and its Role in Computing: Resources for Further Reflection* provides publicly available resources designed to support reflection and conversation related to computing and diversity. The second piece reminds us to reflect on how computing may be used to impact society by focusing on the United Nations' Global Issue

Finally, in addition to the usual "we need your help" requests, our Chair has contributed a list of focus points, or departments within *Computers and Society*, in which you, our members, can contribute short pieces for publication including the benefits and excitement of doing so.

WE NEED YOUR SHORT PIECES



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Part of the Executive team's responsibility is to encourage more voices and varied perspectives on topics relevant to computers and society. Consequently, we at the "SIGCAS Publications Group" are seeking short pieces that are relevant, provocative, diverse, and unexpected for our issues of *Computers and Society*. We also hope they will be fun to write.

The possibilities, effects, implications, opportunities, challenges, myths, realities, and struggles related to computers and society that are being played out every day in millions of different ways are helping to determine who we are and where we are going. We want to capture at least some of that.

Your short piece could raise arguments, issues, critical questions, resource needs, current work, research, reviews, discussions, etc. etc. To that end we have developed a robust infrastructure of departments, divisions, bureaus, and other descriptive categories to help convey to you all that this is a vast, very formal and bureaucratized enterprise.

While some of the names may be fanciful we are optimistic that the articles they help characterize will be compelling, relevant, and influential.

We plan to experiment with this approach. We are currently planning to run several short pieces per issue. And we will probably add new departments as will. We also plan to be flexible but we do insist that these articles be short. (After all the SIGCAS Newsletter will still run longer pieces!) Shall we say 1,200 words max?

To be considered for the next newsletter please submit your short piece to the SIGCAS Newsletter Editor, Rick Blumenthal, editors_sigcas@acm.org, by December 1, 2020 (the subsequent issue deadline will be in March, 2021). Please include "Short Piece" in the subject line.

COMPUTERS AND SOCIETY AREAS OF INTEREST

- News From ____ (community, company, department, movement, country, sector, dimension, rain forest, or what-have-you)
- Your Resolution or Manifesto Goes Here Desk
- Not All is Wrong Department
- Systemic Racism & Black Lives Matter Studies and Reports
- Teaching about Computers and Society
- Social Responsibility in Computing Department
- Department of Development Studies
- Ominous Development Department
- What Could Possibly Go Wrong? Department
- Office of Emerging Technological Directions
- Voices of Practitioners and Younger Professionals
- Department of Diversity and Inclusion
- Climate, Biodiversity, and the Environment Department
- History Department (of SIGCAS and Computers and Society)
- Thrilling Adventures in Computing
- Looking at SIGCAS: Useful, Enlightening, Maddening or Other Influential Fiction, Poetry, Art, and Movies Related to Computing and Society Division
- Department of Technology Assessment
- War and Peace Studies Hall
- Help me work on myProject.dept
- Science Lab
- Religion and Spirituality Division
- Gender Notes
- Underscrutinized Implications Bureau
- Office of Expected and Unexpected Consequences
- What Should We Do Room
- Methods: How to do Computers and Society Group
- Annals of Agnotology
- Algorithms: Good, Bad, and Ugly
- What's a Professional Organization To Do Department
- Automating Evil: Office of Worst Practices
- Chronicles of Civic & Community Tech
- Department of Civic and Collective Intelligence
- Office of Technology Assessment
- Critics Corner (interviews, etc.)
- City Desk / Urban Studies
- Town and Country Consulate
- Point / Counterpoint Forum
- SIGCAS Agenda Development Department
- SIGCAS and Wicked Problems
- On the Job Department: SIGCAS and Employment
- SIGCAS and the Green New Deal
- Personal Perspective Department.
- You Can't Make This Up Department
- Design Perspectives and Perspectives on Design
- Student Voices Division
- Activism Sector
- Patterns of Computing Department
- Limits and Collapse Ministry
- Recent Reviews (books, articles, etc.)
- Steering Tech Department (policy and all the rest)
- Directions and Implications of Advanced Computing
- No Comment Department
- For or From The Archives
- Data and Datafication Office

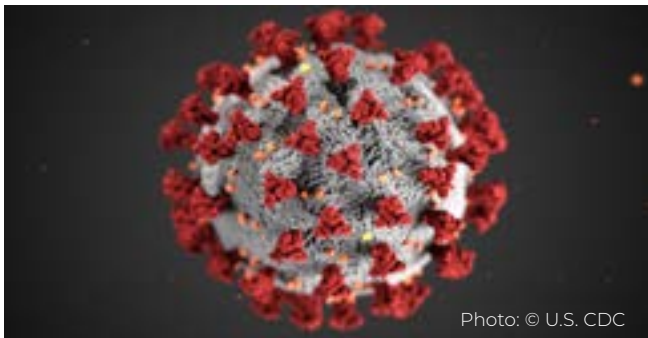
EXTRAORDINARY TIMES NOW AND STRETCHING OUT AS FAR AS THE EYE CAN SEE

BY DOUGLAS SCHULER

As the Chair of SIGCAS, part of my responsibility is to provide periodic updates and perspectives to the SIG membership regarding SIGCAS activities and topics related to computers and society. The "From the Chair" columns appearing in *Computer and Society* provides a medium for presenting these updates and perspectives. It is my honor to contribute my first "From the Chair" column

On December 31, 2019, Chinese health officials alerted the World Health Organization about a mysterious ailment in Wuhan that was growing at an alarming rate. Since then, every day of 2020 has been spent under the deadly and chaotic shadow of COVID-19. The times that are upon us are more extraordinary than the extraordinary times that preceded them.

The pandemic caught most of us by surprise: we were not prepared, either materially or psychologically. Strangely in the US some of the critical research projects that were specifically intended to help forestall these nightmares had been canceled at the federal level months before. The world changed virtually overnight. Circumstances radically altered the way that everyday business was being conducted. Schools with very young students as well as major universities with populations in the tens of thousands went dark or switched to virtual sessions very rapidly.



For many of us, this intense virtualization of everyday life was more of a quantitative change than qualitative one: Much of our business was already being conducted online. In the early days of the pandemic here in Seattle, both Microsoft and Amazon advised their employees to work from home. While this provided an influential civic example, it was easier for those companies to do so for obvious reasons. Other companies and other types of workers, including many of those deemed essential, had no such opportunity. Many in fact were living paycheck to paycheck in a vastly uneven world that suddenly grew more uneven.

Paradoxically, pandemics historically have given rise to innovation. Katherine A. Foss writing in *Smithsonian Magazine* tells how "Past public health crises inspired innovations in infrastructure, education, fundraising and civic debate." During an emergency the rules of the game have been tossed in the air. All bets are off. The pandemic causes us to engage in social imagination where the rules of the previous situation have shifted radically, to rethink the nature of government, of science, of winners and losers, and of information and knowledge, the faking of it and the weaponizing of it.

Police Brutality and Systemic Racism

And while the pandemic was surging, on May 25, massive protests broke out in hundreds if not thousands of cities and towns across the United States and around the world. These actions were catalyzed by the killing of George Floyd Jr., an African American man by a white police officer in Minneapolis, Minnesota who persisted in kneeling on the unconscious man's neck in full view of frantic onlookers who were begging him to stop.

The COVID-19 emergency and the costs that were exacted on communities of color provided some backdrop and context for the massive confrontation to the entire edifice of systemic institutionalized racism. Slavery and the oppression of African Americans in the Americas and the United States in particular dates at least back to the 1500's. And while the legal end of slavery in the US was signaled in the 1860s with the victory of the Union army over the Confederate army, various new types of modes of social and systemic oppression took its place. Like a virus or disease that morphs and adapts to the challenges and opportunities of its environment racism has become deeply embedded and persistent, institutionalized and systemic. Police violence and impunity is of course only part of the much broader problem. The deeper problem is the historically continuous and multifaceted maltreatment of people delineated by ethnic, racial, or other differences which plays out culturally, economically, and personally.

The massive protests help remind us as SIGCAS members that these problems are not going away on their own—even with the help of new computer applications or systems. They force us to probe these issues and go beyond the specific technical knowledge of our profession, to understand these issues more fully and to act in whatever capacity is required. It also specifically challenges us to consider roles that computer scientists may play consciously or inadvertently in perpetuating oppression and urges us to think about how things could be different.

In June 2020 several Black Scholars and others associated with ACM wrote a letter to the ACM Officers and Governing Body. It was prompted when ACM released its statement on the protests and associated issues. The group was concerned about the "vagueness and brevity" in the statement. Their response, a letter entitled "A Call to Action for the ACM" (<https://medium.com/@cnicoleharrington/a-call-to-action-for-the-acm-a3274675de03>) contains specific recommendations including more panel discussions with Black and Brown scholars at ACM events that focus on race and technology, more support for Black and Brown scholarships, and many more. The ACM has committed to a conversation with the signatories of the document which presumably has already begun. The SIGs are specifically mentioned in the article including the recommendation that each SIG publish an annual report on demographics of participation in their events and other initiatives and that many of the structural issues related to race within the ACM have been demonstrated within the context of SIG work. Their concluding section,

before the list of signatories, includes references to several organizations that work at the intersection of race and technology as well as some who focus broadly on racial justice. The letter reminds us of our work related to our role as part of SIGCAS and suggests other avenues related to computers and society. It also can serve as a model for study as well as possible action for us to take.

Getting Back to Abnormal

One of the on-again, off-again, questions in general circulation in these pandemic days is what will things be like when they "get back to normal" at some point, presumably not too far in the distant future. This idea is belied of course by the recent second wave of the virus in the US and other places. At any rate, "normal" is not the word I would use to describe any such post-pandemic scenario, especially in terms of the Earth's climate, that is changing, along with the state of its ecosystems, at unprecedented rates.

The issue of climate disaster still remains in spite of whatever reductions in carbon emissions we might be seeing at the moment. Although by some measurements the pandemic caused a 17% reduction in CO2 pollution, May 2020 was still the hottest May on record. And the small Russian town of Verkhoyansk reached over 100 degrees Fahrenheit, the hottest temperature ever recorded north of the Arctic Circle, in mid June. And later that year, Death Valley in California reached nearly 130F (54.4C), the hottest temperature reliably recorded ever on Earth. Mass migration due to climate change is already occurring in the southern hemisphere at rates that are sure to be disruptive (The Great Migration has Begun, <https://www.nytimes.com/interactive/2020/07/23/magazine/climate-migration.html>, NY Times, July 23, 2020).



Photo: © Getty Images

In other words, "normal" does not describe the historically anomalous situation that we find ourselves in. Also, taking the risk of prolonging our discomfort I would mention that although many characteristics of our current situation, such as oppression, wars, inequality and violence have followed humanity like camp dogs for millennia, we have reached a new point in which we have the capacity to destroy a very significant portion of life on the planet, an achievement that has been reached in large part because of the effectiveness and ubiquity of computers.

Your biggest threats list may look like mine or be somewhat different but the future, however friendly or unfriendly it turns out to be, and for whom, will be shaped to some degree by how we collectively cope with the influences of these trajectories:

- Climate change, environmental degradation and loss of biodiversity, water scarcity
- Authoritarianism and everyday degradation of democracy
- Oppression, inequality, racism, xenophobia, sexism, etc. etc.
- Pandemics, crime war, and violence

- Entrenched, unfair, and unstable economic sphere
- Rampant agnotology, the cognitive smog of ignorance, produced and purveyed by professionals and amateurs alike.

Without a doubt the computers have played indispensable roles in all of the above. Unfortunately it is likely that a more perfect storm is brewing, one in which many if not all of the threatening factors that seem to be kept in check at the moment come into play, cascading out of control in feedback multiplying loops.

Social Responsibility and Computer Professionals

While we computer professionals have the same basic responsibilities that every citizen has, we also have a few more due to our knowledge and influence in an especially significant field. Our understanding of computer systems in the small and in the large, our training, and our day-to-day exposure to system development, corporate plans, and computer usage patterns gives us perspectives that most citizens do not have.

But that specialized knowledge does not really tell us what we should be doing. It would be easier to put plans together if the causes and effects of computers and society could be simply characterized and simply addressed. But that is not possible. Unfortunately this means that finding levers that the computing community can simply push to reach the desired ends is not possible. But denying that we have anything to do with the state of affairs would be irresponsible and intellectually dishonest.

Obviously no one group can assume all the blame or shoulder all the responsibility. And it is generally not true that technology comes in two types, good or bad. But without computer professionals many of the problems of our era would not be so daunting. Nor would any of the possibilities that computers offer be realized without computer professionals. Obviously computer professionals do not make any of these decisions on their own. Power is distributed, albeit unequally. But power is relative and we should not discount our own.

The sad reality is that positive outcomes are not necessarily guaranteed if we leave the steering to the ICT companies and the government. And because the reality is that we can not do this by ourselves, we will need to work with other professional—and non-professional—groups and organizations to make sure that all parties are learning from each other.

People have been working in this area of social responsibility of computing for decades and there are many lessons to be learned. But the opportunities and the challenges we face today are not the same as the ones we faced yesterday. How do we play suitable, effective roles? We, of course, can play to our strength, and focus on computing but this is often not the right approach. Sometimes working outside our comfort zone or as supporting allies is the best route.

We must take our cues from today's realities. The pandemic and the mobilizations around race provide new questions and directions around the virtualization of everything (an area in which we are well-acquainted); unequal risk and "essential" work, and the digital divide in which lack of connection to the Internet can be significantly detrimental, especially in relation to education. Certainly the pandemic points to a variety of popular education projects. We can bring data, data visualization systems, and simulations to the community. We can provide models of pandemics which can help show how "social distancing", mask wearing, and hand-washing can affect personal and community health. We can build games in which communities can work together to help "flatten the curve."

Building capacity for people, including education and access to knowledge and resources for public problem-solving is another extremely important aspect of the job. This could take the form of providing training for non-profit organizations, civic hackathons, and setting up debates between tech critics and advocates. It could also mean establishing new forms of deliberative



UNITED NATIONS

GLOBAL ISSUES

and problem solving platforms such as people's assemblies or climate assemblies that complement other democratic venues (rather than suggest, as techno-utopians are prone to do, that their approach will solve everything and everything that came before is obsolete). The times have also identified new needs that emerged just as suddenly as the coronavirus pandemic or the mobilizations against racial injustice. If, for example, funds for existing police departments are redistributed to make them more accountable, who belongs in these discussions and how should the conversations be conducted? How these questions are addressed would have significant implications for public safety in the future.

Many (or most or all) of the issues related to computers and society are extremely thorny and getting any purchase on them may be very difficult. One problem is that of dealing with fake news and other techniques of professional agnotology that are now apparently much more cost-effective than they used to be. Another would be addressing the outsized power of ICT corporations and the billionaire recipients of their immense profits. (The net worth of billionaires in the U.S. alone has increased by \$167 billion since the pandemic started earlier this year.) And, lastly, the pandemic and the mobilization may suggest increased surveillance approaches but who surveills whom and to what end? And how are politicians supposed to be able to regulate surveillance capitalism or just surveillance for that matter when they do not understand it? Computer professionals can probably help sort these issues out.

Computer Professionals Behaving Responsibly

As the SIG that explicitly focuses on computers and society we have an important and exciting responsibility. My hope is to work with the SIGCAS community to help our SIG be more useful to itself and to the world beyond. To this end we will need to learn more about the interests, ideas, concerns, and aspirations of our members. The critical issue is determining what, if anything, we think ought to be done to help sort things out. We may ultimately design software, develop theories or critiques, convene debates, write white papers, design curriculum, or any number of things including those not typically seen as products of the computing community. And as an ACM SIG we have a variety of tools at our disposal including publications, events, working groups, and other products.

Our focus on computers and society is a link between two worlds: the world of research, development, deployment of computing systems and the world of social interrelationships, institutions, and contexts. In significant ways, computer systems are establishing new social trajectories while at the same time rearranging and disrupting many established social arrangements. But who is shaping these critical directions? How are they doing this —and why? And could or should any of this be changed?

I am happy about my new role at SIGCAS and I am enthusiastic about our future. After all, the future of computers and society is becoming more and more interesting all the time. We will not run out of work! And we have the good fortune of being faced with the most vexing, threatening, and least understood challenges upon which to capture our imagination and focus our attention.

Douglas Schuler

SIGCAS, Chair

SIGCAS, Historian

Public Sphere Project

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The growing role that computing will play in addressing the world's pressing global issues has begun to move to center stage, as *Big Data for the SDGs* (Sustainable Development Goals) is now included among the United Nations' Global Issues. The UN summarizes this Big Data issue as "The volume of data in the world is increasing exponentially. New sources of data, new technologies, and new analytical approaches, if applied responsibly, can allow to better monitor progress toward achievement of the SDGs in a way that is both inclusive and fair" [2]. Elsewhere, we have applauded and argued for computing initiatives, including computer science education, that specifically focus on such "pressing social, environment, and economic problems" [1] and we acknowledge our SIGs commitment to directly tackling such issues.

Just the same, we also believe it's helpful for all of us to occasionally reflect on how we can better serve society by encouraging the computing community to consider how we can assist in chipping away at these global issues. As of this writing, here are the UN's most pressing *global issues*, whose details can be found at the UN Global Issue Overview (and details) Web site [2]:

- Africa
- Ageing
- AIDS
- Atomic Energy
- Big Data for the SDGs
- Children
- Climate Change
- Decolonization
- Democracy
- Ending Poverty
- Food
- Gender Equality
- Health
- Human Rights
- International Law and Justice
- Migration
- Oceans and the Law of the Sea
- Peace and Security
- Population
- Refugees
- Water
- Youth

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THINKING LIKE A LAWYER

A NEW COMPUTER AND SOCIETY COLUMN

BY

JOHANNA BLUMENTHAL

COMPUTERS



SOCIETY

Photo: © Getty Images

Have you ever heard the phrase, thinking like a lawyer? Perhaps the most commonly echoed phrase about law school is that students learn how to “think like a lawyer,” but what does that mean? As a lawyer, who went through the initiating ritual of law school, sitting for the bar, and litigating cases, I have allegedly gained this skill called “thinking like a lawyer.” As I reflect upon how the experience of becoming a lawyer and practicing law changed my thinking, a few things come to mind. First, I am subconsciously scanning for risks and liability everywhere, fabricating fictitious lawsuits in my head that might occur. Second, I care a lot about words, what exactly was said, and the meaning and truthfulness of the assertion when a strict vs. lenient interpretation of those words is applied. Third, I have the ability to navigate complex systems and to guide others less familiar with those systems through the maze. Finally, I have acquired a sobering view of what the legal system does and does not do, its promise and its shortcomings.

Beginning in the Winter addition, the SIG-CAS newsletter will begin featuring a new column called Thinking Like a Lawyer. The col-

umn will explore the impact computing has had on society from a legal perspective. The main goal of the column will be to invite further understanding of the relationship that exists between computing and law, where that relationship is heading and how we, as computing professionals, and we, as members of society might play a role in shaping that relationship.

The impetus for the column came about rather naturally for me. These days questions about technology and its role in society abound. You can hardly access any news source without hearing something about new developments in how we navigate the economic, political, personal and social environment created by the ubiquity of computers in our daily lives. These new developments often lead to questions of whether and how old laws designed to protect society and promote human advancement will be applied to this new and rapidly evolving landscape. Will the big technology companies be broken up as AT&T was in the 1980s? Will congress establish a new agency to regulate social media platforms? Will the rest of the country adopt laws like the California Consumer Privacy Act? Should we partner with hackers? Is it okay for technology companies to release

GPS information to law enforcement without a warrant? Do we need new campaign advertising laws for the digital age? Should K-12 education standards include more computing outcomes? Is it okay to phase out paper and in-person based government systems? Should there be a compensation fund for victims of data breaches similar to the one established for vaccine adverse reactions?

As a philosopher, psychologist at heart, student of computing, lover of interdisciplinary projects and a person who can no longer help, but “think like a lawyer,” my mind naturally desires to create a platform for interdisciplinary discourse among professionals who care about the role computing has in society and furthermore wish to guide that relationship in a positive direction.

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ESSENTIALISM IS THE ENEMY OF THE GOOD: HOW THE MYTH OF OBJECTIVITY IS HOLDING COMPUTING BACK

BY
MICHELLE TRIM

Keywords: Computing, Ethics, Objectivity

Categories: Social and professional topics - User characteristics

Right after the spring semester ended, I was invited to do an ethics workshop for a Data Science for the Common Good graduate student research program [6]. It had been a week since George Floyd was killed by police [15], and weeks before Covid-19 related deaths had initially peaked in most parts of the U.S. Organizations, and then even retailers, started sharing anti-racism statements, promises, and in the case of Amazon, Black Lives Matter banners on their website. Press related to facial recognition technology and algorithmic decision making's increasingly troubling role in our criminal justice system had already begun the reckoning within computer science [1], calling for a fundamental change in how computing professionals think. So, it shouldn't have been surprising that my lesson for these common-good minded, data-science inclined Ph.D. students could be stated simply as explaining the connection between the myth of objectivity and racism. The stop in the middle connecting a belief in objectivity to racism is a concept called essentialism.

Like a lot of things under the sun, essentialism isn't a new idea. Aristotle defended slavery and the subjugation of specific groups of people with the following logic: "Accordingly, society may practice slavery if there are some people who are naturally suited to be slaves" [17]. To be "naturally suited" is to be essentially suited – which is to have an intrinsic quality determining a person's limits, development, and potential so that slavery is the best, the only, and the right role. Like people even today, Aristotle believed that it was wrong to act against what nature had already decreed:

[From Politics] "those people who are as different from others as body is from soul or beast from human, and people whose task (ergon), that is to say, the best thing to come from them, is to use their bodies in this condition—those people are natural slaves. And it is better for them to be subject to this rule" (I.5, 1254b16-19) [17].

The notion that groups of people have a discernible characteristic determining their limits persisted throughout the classical, medieval and even the modern history of most Western countries. The institution of slavery, and the particularly pernicious enslavement of people of African descent by colonial, and then industrial, America relied at least in part on a belief in the naturalness of subjecting this group of people to systematic dehumanization for hundreds of years [9]. Thanks to a poor understanding of science, even for the time period, Francis Galton established the term 'eugenics' to describe the use of selective breeding to solve society's problems [7]. Everyone from women acting 'out of line' by resisting restrictive gender norms to people coping with physical maladies to immigrants living in poverty were blamed on bad genes, resulting in their involuntary commitment to state homes [7]. At the turn of the 20th century prominent eugenicists weaponized the persistent and tacit adoption of essentialist beliefs, strengthening the delusional connec-

tion between value to a society with social characteristics such as race and heritage. The choice of features defining these groups (ethnicity, race, religion, heritage) conveniently coincided with political movements supporting isolationism and restrictive immigration policies, strengthening pathways to wealth accumulation and upward mobility for an increasingly narrow group of American citizens and setting the stage for the racial covenants in housing developments that persisted through the second half of the 20th century [20]. Rather than being seen as the failures of an elitist and racist society, poverty and lack of opportunity became synonymous with laziness, incapacity and bad genetics. No one wants to take responsibility for belief systems that perpetuate targeted, structural inequity, and this is especially true in the United States where the 'American Dream' is supposed to be available to all.

Fast forward to the 21st century and members of specific groups are still being brutalized in the name of the law, and entire fields of study still doubt that members of these racialized and gendered groups can possibly achieve the same level of greatness as their Anglo-Saxon male counterparts. Larry Summer's now infamous quip that boys outperform girls at math for genetic reasons clearly seemed uncontroversial to him and many of his colleagues [13]. When the president of Harvard says that girls are biologically inferior to boys when it comes to math in the year 2005, he reified essentialism as a means for making valid assumptions about people, coming close to invoking those tired arguments made by Eugenicists. We continue to see the pervasiveness of pseudoscience in algorithmic modeling that includes race as a determining feature, such as the use of darker skin color resulting in a higher risk score in IBM's facial recognition software [18]. Just as Aristotle tried to use logic to justify the humanity of slavery, there are those that will attempt to use 'objective science,' like genetics, to make claims about a person's character and intelligence. For example, incarceration data suggests that criminals are more likely to be Black or other people of color [16]. And yet, the most credible story told by the data is that people of color are more likely to be incarcerated. It doesn't say anything about particular proclivities or pre-determined dispositions, or the reason for that greater probability besides skin color and racial identification [19]. If systems of justice operate on the assumption that racial identity and guilt have a determining relationship, then that bias is likely to manifest throughout the criminal justice system [23]. This leaves the intelligent observer to ask – are Black people more likely both to be arrested and to be incarcerated simply because they are Black?

Just as beginning a data analysis free from assumption enables us to observe race correlating with a disproportionately higher rate of incarceration and ask 'why?', it also enables us to recognize the political aspect of the characteristics that we have been using to classify non-White groups of peo-

ple from slavery to eugenics to algorithmic models. Race, gender, and even social class are all cultural constructions. They are real insofar as they result in material impacts on human beings' lives and access to opportunities, but they are also imaginary in that there is no biological connection between a body and these classifications. The only life these groupings have at all is that which we give them through our language, our stories, our policies, our cultures, and our politics. Essentialism is not supported by science. And when we attempt to examine data reflectively, we often find that variation within these so-called classifications of people is much greater than the variation between these groups. Even studies of linguistics have shown that gender categories cannot be naturally derived from the data, from the phenomena under examination [4]. More studies than can be listed here have demonstrated over and over again that women-identified people are just as likely to excel in Math and STEM as those who are men-identified. And yet, research has shown that racially-based attitudes of professors that take that small step from essentialism to having a fixed mindset might sabotage the success of students of color in their classes [5]. Essentialist assumptions about people based on their identity enable the fixed mindset bastions within our field to thrive.

The resistance to accepting social constructions of identity within computer science is entwined with some longstanding beliefs about who can be good at computing, and those are often shaped by our mental models of computing success. Even though many prominent voices within CS have spoken, written and published on this topic, there is still a lack of diverse representation of identity in many academic computing programs. Privileged circumstances such as upbringing, the economic freedom to follow one's 'bliss' in school along with gendered and racialized narratives about who belongs in higher ed fit together to form a web of affordances and restrictions shaping people's opportunities to obtain the markers of success that academic computing programs are looking for. Artifacts like standardized tests which have been found to be both culturally biased and poor predictors of educational success are still too often the meter stick determining entrance to the field. In fact, the SAT was invented by eugenicist, Carl Brigham, who "wrote that the test would help prove the superiority of the white race" and help maintain racial purity [11]. When we think about the problems with facial recognition technology, most notably its poor performance with Black faces [3], we might recognize that to some degree, this problem is at least in part due to a lack of diversity among CS researchers. As a result, we might also note the dramatically low number of people of color earning Ph.D.s in computer science. Before we ramp up our recruitment efforts to the nth degree, we should look first to see what role the GRE and other "objective" measures play in our graduate program application processes. Studies have shown that, "none of the supposedly objective credentials predicted anything recognizable as scientific productivity—not first-author publications, conference presentations, fellowships or grants won, completing the Ph.D., passing the qualifying exam, or proceeding swiftly to dissertation defense or to the degree" [2]. Sometimes success in school is simply a product of being a member of a target audience, or as CS Education researcher, Mark Guzdial states: "when we design our classes for the majority of our students, we are making explicit and implicit choices that make it harder for other groups" [14]. If such 'standardized' tests and 'objective' measures of an applicant's fitness for graduate school, of their intelligence, are in fact culturally biased and therefore not objective at all, then computer science needs to own up to that reality and jettison these measures that simply reify the performance of behaviors associated with students from particular backgrounds as being indicative of ideal students.

Science has been used to justify practices and actions against groups, both in terms of who deserves access to education and who is worthy of accomplishment, and the myth of objectivity has lent an unearned credence to these assertions. If there is no factual, evidential, or empirical reason to connect a collection of people under one group identity, then that group identity cannot be used as a basis or a feature in scientific research as if it is

always already determinant. This means that computing must examine the epistemology driving the field's acceptance of and perpetuation of essentialism, fixed mindset, and the myth of objectivity. If a person, any person, can change their intelligence of computing through hard work, through practice and concerted effort, and if having computing knowledge equips a citizen to challenge assumptions about the particular way that computers infiltrate our civic lives, then doesn't computer science have an ethical obligation to model that same willingness to question assumptions in all that it does? Some researchers think so. In one example, a data scientist extended the work of a previous survey, helping us to choose more thoughtful gender categories when she found that "most non-binary and non-cisgender individuals identified as "nonbinary, genderqueer or gender non-conforming", "male", or "female" rather than "A different identity" [10]. Groups like the Algorithmic Justice League work to equip citizens, policy makers, researchers, and influencers with knowledge about ways that AI can "perpetuate racism, sexism, ableism, and other harmful forms of discrimination" [22]. In order for computer science to do its part in breaking down racist practices, resisting white supremacist ideology, and perpetuating harmful, essentialist stereotypes, it must change the way computing professionals think. As Nikki Washington argues, this must begin with those of us teaching computer science in our college CS programs, "where the demographic representation mirrors that of industry. With no formal courses that focus on the non-technical issues affecting marginalized groups and how to address and eradicate them, students are indirectly taught that the current status quo in computing departments and industry is not only acceptable, but also unproblematic. This directly affects students from marginalized groups (as the reasons for attrition are similar in both higher education and industry), as well as faculty (as biased student evaluations directly affect hiring, promotion, and tenure decisions)" [21]. If we do not address the false objectivity driving problems with our admissions and hiring processes, and if we do not resist the urge to see success in computing as proof of innate talent, then we will be working on the same side as those eugenicists of the previous century. We will be taking a huge step backward right when computing needs to step up, to walk at the forefront of anti-racism and equity. As computing speeds its infiltration into the fabric of our daily lives, we must look to our educational programs and ask ourselves if we are really doing all we can to prepare tomorrow's societal architects with the tools they need. If we can understand computing ethics education to be primarily about these questions of identity and justice, of equity and opportunity, rather than an overreliance on classical philosophy and other colonizing intellectual traditions, then that could be a start at achieving some of what is needed to move computing toward anti-racism as a central tenet and away from the myth of objectivity for good.

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SHORT PIECE

DATA FEUDALISM

BY
MARC SUNET

Keywords: Computing, Data, Regulation

Categories: Social and professional topics - Computing / technology policy

Data is capital in the age of surveillance capitalism. Regulation should be passed and enforced to control how companies collect, store, and use data. Today, this is done surreptitiously, without people's knowledge or consent. But beyond that, perhaps data should also be taxed.

A hypothetical company that builds a voice recognition system will, as expected, collect and hoard people's voice permanently to develop their systems (though not all of them do). If the company is worth \$100B, how much are the voices that power the system worth? Let's say it is 80% or \$80B, and the remaining \$20B due to clever engineering and implementation of research papers. That's quite a lot; if the company has collected the voice of 1 million people, then you could say that each person's voice is worth $\$80B / 1M = \$80K$. Except that people do not have a stake in this adventure, and their worth is \$0. As it is today, the relationship between the company and the people is a feudal one: the lord provides a service while the peasants harvest the data.

This techno-feudalism needs to change. It is true that the data is not valuable without the company's efforts to turn it into a useful voice recognition system. But the system is also not valuable or even realizable without the data. Yet, the company reaps all the benefits, and when left unchecked, grows in wealth and power while the peasants grow in their misery.

A tax on data could lessen some of the above evils. At the end of the day, data is a form of capital and should be taxed as such. Thus, people would benefit directly from its collection, storage and use. Together with their rights to manage (correct, delete, etc) their data, that would give them back a stake in the adventure. And the taxation could also disincentivize corporations to hoard as much as they can, instead steering them to collect and store only as much as is necessary. A tax on data, provided regulations exist to control its collection, storage and use, could perhaps revert back some of the pitfalls of techno-feudalism.

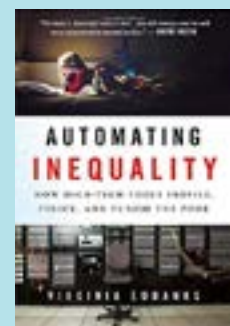
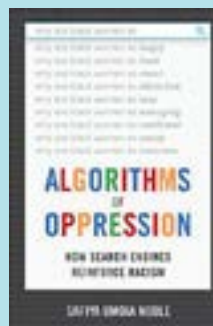
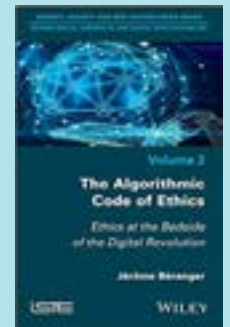
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RECENT BOOKS

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The more that you learn, the more places you'll go"*
– Dr. Seuss



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DIVERSITY AND ITS ROLE IN COMPUTING RESOURCES FOR FURTHER REFLECTION

BY
COMPUTING FOR THE SOCIAL GOOD IN EDUCATION MEMBERS

Keywords: Computing, Ethics, Social Good

Categories: Social and professional topics - User characteristics

Last July, members of Computing for the Social Good in Education (CSG-Ed) community issued the following statement and associated resources.

"On May 25, 2020, George Floyd (a 46 year old black man) died while handcuffed and pinned to the ground by a white police officer, Derek Chauvin. The incident was recorded by a bystander and the video footage went viral. In the days following Floyd's death protests erupted around the country and the world. Many protests have turned violent and the National guard have been called out in 21 states 1.

With such protests, which continue daily through the time of this posting¹, in the background, many have taken this time to reflect upon the past injustices, the current realities and whether, to what extent and in what ways such injustices remain systemic in all facets of our lives.

As computing organizations and institutions throughout the country grapple with the issues brought to a head by the recent protests, CSG-Ed wanted to support such reflections and conversations by providing some resources to its practitioners and members.

The following is a list of links to publicly available resources. This list was compiled by some of our CSG-Ed members. The list is grouped by resource type. The list is not exhaustive and does not include every perspective or approach to said topics. We encourage you to use this list as you see fit. If there are additional resources that you feel would be beneficial to share with CSG-Ed, we'd love to hear about them. Please email our webmaster at csged-steercomm@gmail.com . Include CSG-ED Resources in your subject-line.

Books

- [Race After Technology](#) – R. Benjamin (2019)
- [Algorithms of Oppression](#) – S. Noble (2018)
- [Black Software](#) – C. McIlwain (2019)
- [Grading for Equity](#) – J. Feldman (2019)
- [White Fragility Why It's So Hard for White People to Talk About Racism](#), – R. DiAnjelo (2018)
- [Race on the Brain: What Implicit Bias Gets Wrong About the Struggle for Racial Justice](#) – Jonathan Kahn (2017)
- [Implicit Bias in Schools](#) – Gina Laura Gullo,, Kelly Capatosto, Cheryl Staats (2019)
- [Biased: Uncovering the Hidden Prejudice That Shapes What We See, Think, and Do](#) -Jennifer L Eberhardt (2020)
- [Non-Violent Communication](#) – Rosenberg (2015)
- [Dignity](#) – Diane Hicks (2013)
- [Culturally Responsive Teaching and the Brain](#) – Zaretta Hammond (2015)

Blog Posts/Articles

- [How We Need To Change For More Inclusive and Open Publication Practices](#) – Julie Williamson (2020)
- [A Letter to my White Male Friends of a Certain Age](#) – Dax-Devlon Ross (2020)
- [CS Teachers its \(Past\) Time to Learn about Race](#) – Mark Guz Dial (2020)
- [How to make a racist AI without really trying](#) – Robyn Speer (2017)
- [Data science, ethics, and the 'massive scumbags' problem](#) – Stilgherrian (2019)
- [5 Steps to take as an Anti-Racist Data Scientist](#) – Emily Hadley (2020)
- [How to Be an Anti-Racist](#) – Ibram Kendi's (2019)
- [95 things that White people can do for racial justice](#) – Corinne Shutack's (initially posted 2017, updated regularly)

Websites with Resources, Action Steps and Difficult Discussion Support

- <https://implicit.harvard.edu/> has tests that you can take (kind of fun and game like) that help to reveal implicit bias in various categories.
- [Center for Nonviolent Communication](#). These folks have written numerous books and articles on conflict resolution, how to have difficult conversations that are productive and how to speak to one another without violence.
- [Just Peace](#) on how to build a container for conversation.
- [Crisis Guidelines](#) – Juan E. Gilbert
- [National Conflict Resolution Center](#)
- [B-Corp's](#) list of resources
- CMD-IT supports the Call to Action to the Computing Community from Black in Computing and Allies The [open letter](#) provides an excellent list of actionable items for individuals, organizations, and communities.
- [Share your story](#), written or video. We welcome anonymous sharing. Our goal is to share our stories on the CMD-IT website to raise our voices about racial injustices experienced by many in the Black community. It is also a teachable moment and provides education to those that want to understand the detriment of racism in society.



¹Editor's Note: As this issue of *Computers and Society* goes to publication, "Black Lives Matter" protests continue throughout the United States, as videos of additional incidents continue to go viral.

- Amal Awad: [Moving beyond the token minority](#)
- [The untapped genius that could change science for the better](#)
- Rocío Lorenzo: [How diversity makes teams more innovative](#)
- Joy Buolamwini: [How I'm fighting bias in algorithms](#)
- [What baby boomers can learn from millennials at work — and vice versa](#)

Computing Groups

There are numerous computing societies and professional groups geared towards a variety of interests and audiences. Such groups may have their own resources and support. There is likely a local group in your area. If you need help or want recommendations contact csgedsteercomm@gmail.com.

Spark a Discussion

Within a teaching classroom, reading current events or other fact-based resources with others can spark a discussion about these issues. Two examples of such sources are below:

1. *News Article*

[‘The Computer Got It Wrong’: How Facial Recognition Led To False Arrest Of Black Man](#)

2. *Bureau of Labor and Statistics Demographics in Computing*

Table 1 lists United States Bureau of Labor Statistics demographic data in computing for various computing occupations including percentages of total employment in an occupational category for various minorities.

The significant employment differences between men and women and white ethnicity and other minorities makes for a great conversation started.

— The CSG-Ed Team

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Table 1. Employed persons by detailed occupation, sex, race, and Hispanic or Latino ethnicity (January, 2020).

Occupation	Total Employed ²	Percent of Total Employed				
		Women	White	African American	Asian	Hispanic Latino
Computer and Mathematical Occupations	5,352	25.8	65.7	8.7	23.1	7.8
Computer and Information Research Scientist	24	–	–	–	–	–
Computer Systems Analysts	663	40.1	67.8	9.7	20.3	8.3
Information Security Analysts	125	17.1	74.6	16.6	7.6	12.9
Computer Programmers	454	20.3	67.8	8.5	21.8	8.7
Software Developers, applications and Systems Software	1,815	18.7	54.0	5.8	37.5	5.1
Web Developers	193	41.4	77.6	6.7	12.0	4.6
Computer Support Specialists	547	26.4	74.2	10.5	12.7	11.3
Database Admins	106	30.2	72.0	6.8	16.7	6.2
Network and Computer Systems Admins	199	26.1	77.2	9.7	11.7	8.5
Computer Network Architects	106	9.2	76.1	13.1	10.3	14.1
Computer Occupations, all others	808	23.6	70.5	12.7	14.1	9.7

²Numbers in Thousands

NOTE: Estimates for the above race groups (White, Black or African American, and Asian) do not sum to totals because data are not presented for all races. Persons whose ethnicity is identified as Hispanic or Latino may be of any race.

IS COMPUTING HIDING BEHIND A MASK OF SOFTWARE NEUTRALITY?

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Recently, I've been reading Kendi's *How to be an Antiracist*, in which he posits "there is no neutrality in the racism struggle" and further notes "the claim of 'not racist' neutrality is a mask for racism" [5]. This position and his subsequent justification made me wonder whether software can be neutral and what might be hidden by computing neutrality's mask?

In order to question the neutrality of software, we must determine what it means to be neutral? Since neutrality is the state of being neutral and we're applying it to software, the following dictionary sense is closest to how the term appears to be used when claiming software is neutral,

"neutral (adj). 1. Not inclining toward or actively taking either side in a matter under dispute" [3].

Although this definition appears straightforward, there are a few points worth considering. Given the previous definition, "neutral" always appears within the context of a dispute. For example, consider the statement,

"Our software is neutral with respect to X." (S1)

This definition implies a dispute over X. If X is not disputed, this statement is nonsensical. For example, the statement,

"Our software is neutral with respect to platform" (S2)

When reading this statement, in order to resolve the tension between "neutral" and "platform", the human brain starts imagining a conflict about platform that was not stated. The truth of this statement is that it executes on all platforms, which establishes a juxtaposition between our neutral software and software that favors a platform (i.e. only executes on a particular operating system).

Alternatively, there may be no agreement as to what X refers to. If we reconsider that platform refers to a political platform in Statement S2, there may be a lot of dispute about X. Finally, is it possible that something besides the previous definition was intended for the adjective neutral.

As language is all about communication, I'm reminded of the *forces* used to characterize the meaning of utterances in Speech Act Theory [3]. From this perspective, the *locutionary* force of a statement focuses on its literal meaning. With respect to the locutionary force, neutrality in Statement S2 is obviously declaring the fact that the software doesn't prefer a particular platform over another (i.e. it doesn't take a side in the dispute that platforms are better and worse). However, there may also be instances of where an *illocutionary* force is associated with a statement. An illocutionary force focuses on the result implied by the statement. Consider the statement,

"Our software is neutral with respect to our user's postings" (S3)

Read from an illocutionary force perspective, we might interpret this statement as, "our software is not responsible for our user's postings"

Finally, there may be a *perlocutionary* force associated with such a speech act, which is the actual effect of the statement. For example, in statement S3 by being "neutral" the speaker is not merely suggesting a lack of responsibility, but is asserting that there is no responsibility (i.e. that they cannot be held morally or legally accountable for their user's postings). We'll return to this position in a moment. In the meantime, let's reconsider Statement S1 and its locutionary force.

Self-Referential Neutrality

There exists a well-known dispute in which it is impossible for software to be neutral. As an umbrella term, "computing technology" is used to categorize a plethora of concepts including software. Many members of the computing community and general public dispute the societal contribution of computing technology, or at least aspects of it. As a recent example, consider *the Social Dilemma* project and film, whose Web site home page claims,

"The technology that *connects us* also *controls us, manipulates us, polarizes us, distracts us, monetizes us, divides us*" [6].

and asks us to "help change how technology is designed, regulated, and used" For our current purpose, we need not concern ourselves with the nature of this dispute, but simply realize the dispute exists.

As software is a kind of computing technology, consider the following self-referential statement,

"Our software is neutral with respect to *computing technology*." (S4)

As we attempt to discern the locutionary force (meaning) of this statement, we realize its straw-man nature. Obviously, the act of creating software, which we the reader assumes has already happened, leads us to the conclusion that the speaker has taken a side in the dispute over creating computing technology, and thus the speaker cannot be neutral with respect to whether we should produce technology? However, a careful reading of S4 applies the term neutral to the software itself. As software is computing technology, it can not hope to be neutral with respect to its own existence. We refer to this technology perspective of neutrality as *Self-Referential Neutrality* and claim the postulate,

It is not possible for software to be neutral. (P1)

since there always exists a self-referential technology dispute for which the software cannot be neutral.

Given P1, any sincere claim of software neutrality must be either assuming a different definition of neutral than previously given or not making a self-referencing statement to its own type (again, we're assuming the statement isn't intended to convey an illocutionary or perlocutionary force, also as previously described). Admittedly, it doesn't seem likely that general self-referential neutrality is what most computing practitioners intend when they claim their software is neutral. However, if we assume the neutral adjective points to a different dispute, perhaps software may be neutral in another context.

Requirement Neutrality

We have used self-referential neutrality to refer to the tension between software neutrality and disputes in which the software is a kind-of thing being disputed. There is another form of self-reference type of tension that results when software refers to the stakeholder requirements it is attempting to satisfy. For example, consider the statement

"Our software is neutral with respect to stakeholder requirements." (S5)

The unlikelihood of this statement stems from that fact that presumably the

¹Although I am responsible for this opinion's content, I wish to acknowledge Johanna Blumenthal for helping shape my thinking on this topic.

developers do not see an associated dispute with these requirements since in creating the software, they are apparently aiming to satisfy such requirements. To the extent the software meets its requirements, how can the developers, or the software itself, be neutral to requirements it embodies. Once again, postulate P1 is affirmed since the development (creation) of software is not neutral to the satisfaction of its requirements.

The careful reader will have notice our qualification of "apparently" when referring to developers being in agreement with the requirements of the software they are creating. Developers who are not in agreement with the requirements associated with the software they are developing are behaving unethically and violating several ethical principles and ethical responsibilities found in the ACM Code of Ethics and Professional Conduct [1]. However, we leave how an ethical software developer should act when in disagreement with the requirements they are working as a topic for another Parting Opinion.

The careful reader may also have noticed that I glossed over whether an actual dispute exists regarding the non self-referencing aspects of the requirements in Statement S1. In fact, this is what software neutrality claims are referring to. From a computers and society perspective, make no mistake, we have not yet addressed specific software requirements and whether deciding to pursue a particular requirement can be neutral.

Specific Requirement Neutrality

When analyzing specific requirements we address one requirement at a time in order to determine its neutrality. When in engage in this neutrality analysis, we have uncovered two types of inquiry. Each is addressed briefly below.

De Jure Neutrality

We are borrowing the "de jure" terminology from jurisprudence. By *de jure neutrality*, we are referring to inquiries that ask is the requirement neutral at face value. For example, if we read S2 as a requirement that the software should execute on all platforms (e.g. Android, IOs, etc.), the plain reading of this requirement is neutral with respect to platform. Alternatively, the requirement that an Internet search automatically filter out racists remarks, such the racists remarks are not display to the user, the plain reading not neutral since it supports a policy against racist remarks. Although society might support this requirement, there is obviously a stance being taken.

De facto Neutrality

Likewise, de facto is borrow from jurisprudence. By *de facto* neutrality, we are referring to inquiries that ask, is the affect of implementing the requirement neutral. As a classic example, consider a machine learning algorithm implementing gradient descent. If the requirement is for the AI software to detect and detonate land mines, when it is implemented it does exactly what we expected it to do. By contrast, a requirement to identify individuals based on facial recognition, thus far, such implementations have resulted in inaccurate identifications of individuals belonging to certain racial groups (i.e. the software performs better for some groups than other). That is, when we read the requirement, we expect any individual to be accurately identified, but this is not the result.

In this example, there are two ways we can fix this issue. Either we go back and change the requirement to more accurate describe the populations the software works for, e.g. this software identifies white individuals based on facial recognition, which make our requirement a *de jure* non-neutral requirement, or we can go back to work and try to satisfy the requirement as originally written (e.g. fix the training data). If we do nothing, our software is not neutral with respect to this software.

Difficulties with Software Neutrality

There are numerous recommendation applications that allow users to review businesses. As a result, these reviews are publicly available online. Although policies regarding who can post and when postings are removed vary among companies, most of these companies claim an air of neutrality with respect to the postings. Such review applications exist for all types of businesses including medical providers, educators, lawyers, financial planners, etc.

These professional's responsibility to confidentiality limit their ability to respond publicly. For example, when a customer post a negative review, most businesses can respond publicly to counter the negative review. Alternatively, a Physician with a negative review from a patient that the doctor knows is upset because of a refusal to prescribe unnecessary medication (e.g. narcotics or antibiotics) per evidence-based medical practice. However, with doctor-patient confidentiality prevents the physician from being open about the addiction/illness in a public forum. The only recourse for the professional is to push for different the review platform to have different policies.

In situations where the software provider claims the software is neutral, a professional might counter claim the software vendor is hiding behind a mask of software neutrality to avoid changing their policies and risk losing users. Is this the case or is the software providing a service to society by allowing for uncensored reviews?

As another example, consider a chat or instant messaging type application. On platforms like these, users are generally enable to communicate about whatever they want to in a variety of media (e.g. text, images, etc.). Companies who provide these platforms can, and have in the past, assisted law enforcement in identifying criminal behavior. Some companies have chosen to provide encrypted chat in order to privacy to their users. However, encrypted communications are also hidden from the company providing the platform, which prevents them from assisting law enforcement. Some argue that encrypted chat platforms are inherently neutral with respect to content. However, this apparent neutrality may mask criminal activity. Is this company neutral or is this actually promoting criminal activity?

Unfortunately, space prohibits us from presenting additional examples. However, if the SIG membership is interested in further exploration of software neutrality, let us know since we believe this opinion is only a beginning.

Conclusion

We began our discussion by exploring what it means to be neutral. As we delved into software neutrality, it appears that in many respects software can never be neutral. At first, this position seemed a little uncomfortable since neutral software seems like a good idea (e.g. Net Neutrality). However, as members of SIGCAS, we realized that we don't want neutral software. Instead, we want our software to transparently promote positive societal values. As our examples suggest, one person's neutral might be another taking a positive/negative side, or missed opportunity to do good.

Elsewhere, we have suggested that "doing no harm isn't the same as doing good". It appears the same is also true for neutrality. That is, "being neutral is not the same as doing good". We encourage our SIGCAS members to be unapologetically not neutral!

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