

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

INTRODUCING THE SIGCAS EXECUTIVE COMMITTEE



Doug Schuler - SIGCAS Chair.

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. I am an 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 publication ACM SIGCAS Computers and Society, which is published three to four 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

2021

The 4th ACM SIGCAS Conference on Computing and Sustainable Societies (ACM COMPASS 2021)

2021 — More details will be announced in January 2021 (Virtual) — <https://acmcompass.org/>

Publishes significant and original research from a broad array of computer and information sciences, social sciences, environmental sciences and engineering fields that support the growth of sustainable societies worldwide, especially including under-represented and marginalized communities.

Computers, Privacy and Data Protection (CPDP)

January 27-29, 2021 — Brussels, Belgium — <https://www.cpdpconferences.org/>

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

Computing for the Social Good in Education Checkup: A Renewal on Why We Became Educators (CSG-Ed)

March 10, 2021 — Virtual — <https://www.sigcas.org/csg-ed-2021-symposium>

Computing for the Social Good in Education (CSG-Ed) focuses on approaches for producing computing graduates who are focused on using their computing education towards the benefit of society

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

Early March, 2021 — Virtual Event — <https://facctconference.org/2021/>

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.

The 10th International Conference on Smart Cities and Green ICT Systems (SMARTGREENS 2021)

April 28-30, 2021 — Online Streaming — <http://www.smartgreens.org/>

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 10th International Conference on Communities & Technologies (C&T 2021)

June 21-21, 2021 — Seattle WA, USA — <https://2021.comtech.community>

The focus will be on "Wicked Problems in the Age of Tech" and welcomes participation from all sectors for whom interaction between community and technology is important. See website for information on papers, workshops, demos, and community day.

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

2021 — Aveiro, Portugal — <https://goodtechs.eai-conferences.org/2021/>

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 the final 2020 issue of ACM SIGCAS *Computers and Society*. To say the least, an interesting year. First and foremost, I'd like to thank each responder to our call for Short Pieces, which have enhanced this issue. Also a special thanks to our regular column contributors.

Our new Thinking Like a Lawyer column kicks off in earnest this issue with a contribution from Johanna Blumenthal, whose who has earned a J.D., B.A. in Philosophy, B.A. in Psychology, and is a current graduate student studying Software Engineering. As a computer scientist, I find her non-CS perspectives enlightening.

We've also begun a historical events in computing column. We acknowledge the fiftieth anniversary of the publication of John Conway's game of Life.

Michelle Trim, continues to be a blessing to the SIGCAS community in her regular column contributions. This issue she presents a nicely woven year-end synopsis that includes a focus on misinformation and accurate data reporting and the importance of language usage in technology. As my Parting Opinion suggests, I once again feel that Michelle and I are "kindred spirits" noticing many

of the same issues (since I write my opinion before reading submissions,) but somehow I'm simply not performing at her level.

This issue's Short Pieces range across various topics beginning with Taney Shondel's comments on the potential benefits to society from increased interactions among computer and social scientists. Tapan Parikh and Samar Sabie provide an interesting perspective on destruction and design based on observations of workshops that included middle school youth. As highlighted in the piece, implementing new software designs replaces and thus destroys in some fashion previous designs.

The Short Pieces continue with an examination of issues related to smart cities and the question of "How to support cities as smart societies?" by Aldo de Moor. It's difficult to read Norberto Patrignani's subsequent piece on the "IT without Borders" non-profit without feeling good about how computing professionals can contribute to betterment of society by "providing help to people living in situations of poverty and marginalization". Miguel Angel Perez Alvarez examines interaction between students and autonomous systems and its effect on the development of intellectual meta-cog-

nitive skills.

An excellent contributed article by Michael Heron and Pauline Belford continues commentary on the "The Scandal in Academia" case study. This extended case study is intended for use as a teaching and discussion aid for educational practitioners looking to introduce elements of computer ethics into their curricula.

In this issue my Parting Opinion focuses on the nature of descriptive and prescriptive software models and their potential relation to software bias.

As we conclude 2020, I'd like to thank the SIGCAS Executive Committee and web master for their assistance with *Computers and Society*. I'd also like to thank ACM for ensuring that *Computers and Society* is included in the Digital Library. A special thanks to our SIGs members, who believe that it is important to focus on the impact of computers on society.

Finally, I wish everyone a happy and safe new year.

WE NEED YOUR SHORT PIECES



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 at 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 March 1, 2021 (the subsequent issue deadline will be in May, 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

FROM THE CHAIR

SUNSET IN SEATTLE

BY DOUGLAS SCHULER

One of the standard things at the end of a year is to reflect back and look forward. Which I will do — but don't let me go on too long!

As is obvious this has been a helluva year. And now the longest night of the longest year is looming (northern hemispherically speaking) and soon after, a new year altogether, a new year that may be quite different than this one.

While the focus on the pandemic seems to have kept some issues in the background, many of the world's most virulent and tenacious problems are gathering steam. But what does that have to do with computers — and members of SIGCAS?

Computers are becoming ever more central to everything we do. But why does it feel that we still don't know how to use them correctly. *Anybody can screw things up, screwing things up on a monumental level requires the tireless power and reach of computers.* And we seem to see evidence of that every day.

The pandemic has been disastrous for many but an unexpected boon for others, particularly those in the tech industry. The Amazon head Jeff Bezos, has seen his net worth increased by 65.7 billion dollars this year (<https://www.npr.org/2020/12/10/944620768/theres-rich-and-theres-jeff-bezos-rich-meet-the-members-of-the-100-billion-club>) highlighting the potential for democratic distortion as income disparity increases.

Criticism of the various big tech enterprises has also been mounting. In the US the legislature has begun hearings into antitrust violations, concentrating on unfair marketplace practices. At the same time, the increasing number of organizations and studies looking at AI and injustice by algorithm, practices that the legislative actions disregard, demonstrates at the very least the controversies that the new focus on tech is unleashing.

On the other hand, what progress would the world's scientists have been able to make in relation to Covid-19 vaccine without computers. And how many universities and businesses would have been lost without the availability of computer teleconferencing?

But for all the scientific and technological advances our social trajectory may be heading the other way. Scientific and technological achievement doesn't necessarily equate to increasing civic intelligence. See for example the pushback against science, anti-vaxers, climate change deniers, and the like.

And the US president, Donald Trump, has been



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blaming technology for his loss at the polls. As SIGCAS members know all too well, technology is not foolproof. But wholesale blaming of technology without any evidence to back it up does real harm to our faith in democratic systems which must rely on technology to some degree.

Also, as of this writing, in a recent batch of news that the computer age has enabled, there has been a gigantic breach of US government and business computer systems, allegedly hacked by the Russian government or proxies. A new, perhaps under acknowledged, cold-war? When—and how—will we learn the consequences of these activities?

I've been the Chair for nearly six months and I feel that I'm still learning. I probably feel that way because it's true. But into the breach we are thrust. Although the impact of computers and society is enormous and our numbers and our impact may seem small I'm hopeful that with some effort we can amp up both our numbers and our impact.

There are many activities in the new year that are relevant to SIGCAS members. In mid-January, the New Public Festival will take place, <https://newpublic.org/festival>. Communities and Technologies 2021, <https://2021.comtech.community>, a conference that I am working on will be focusing on "Wicked Problems in the Age of Tech." The conference is planned to take place physically in Seattle in mid-June but the organizers are planning for virtual participation as well. And later in the year COMPASS '21, the 4th ACM SIGCAS Conference on Computing and Sustainable Societies will take place virtually. Some of the COMPASS focus areas include AI & Social Impact, Development, Economics and Policy, Environment, Climate Change and Sustainability, and Health.

As you know, the SIGCAS board conducted a member survey and we'll be getting back to you on that. Lisa Kaczmarczyk, with consultation from the rest of the executive board, developed the survey. We've only glanced at the results so far

but it looks like every question elicited interesting and actionable responses. With this in mind, and with your help, the board will be developing opportunities to think and work together based on the interests and issues of our members.

The survey is also very likely to provide some good insight into who we are and who we would like to be. I don't think we're too old to learn!

One of the new approaches we've taken is the idea of the "Short Pieces" format for the SIGCAS newsletter. We encourage your short pieces for our newsletter. And don't forget to post to our under-utilized announcements mailing list or tweet to us at @acmsigcas.

Personally I remain interested in the idea of working groups and one of them could very well be one that collaborates with the brand new SIGEnergy. (see the correspondence with them, this issue.) I'm also hoping that we can convene one or more workshops.

I hope that everybody is surviving, if not actually thriving in these times. I think we've learned a lot in 2020. About the possibilities and the challenges that lie before us. About hope and anxiety. Perhaps 2020 was a bit of a rehearsal for the years ahead?

Whatever else we can be sure that computers will be playing major roles in virtually all the scenarios we can imagine for the world — and our SIG — moving forward in the future, hopefully with our eyes, ears, and minds, wide open. We look forward to working with you all for inspiration and collaboration in 2021!

Douglas Schuler
SIGCAS, Historian
Public Sphere Project
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THINKING LIKE A LAWYER

TRUST ME, I'M A PROFESSIONAL

BY
JOHANNA BLUMENTHAL

Keywords: Computing Professionals, Public Trust, Law

Categories: Social and professional topics → Computing Industry, Computing Profession

COMPUTERS



SOCIETY

Photo: © Getty Images

Earlier this year, I volunteered to help maintain the website content for an organization with which I am associated. When I got into the administrative portion of the WordPress website, I realized that no one had made any updates to the plugins for the past a year. Knowing that many such updates patch security exploits and keep the site working properly, I was a bit unnerved.

It turned out that the professional who had been helping with the website, or as the organization called him, “website guy,” who had originally been hired to remodel the website, had continued working for the organization performing one-off tasks as requested without any formal relationship between him and our organization. Although he probably saw the updates that needed to occur, he had never been asked to maintain the site and therefore did not. On the other hand, the volunteers in charge of this non-profit organization didn’t know they needed to ask specifically for him to update the plugins and let them know of any other necessary changes to keep their website software secure and up-to-date including best-practices for managing and maintaining a WordPress website.

During my efforts to establish a regular maintenance relationship with our “website guy”, someone on the organizational board informed me that

they had a website guy who was cheaper. Eventually a decision was made to change providers. As I went about the task of switching website maintenance providers, questions began swimming in my head:

- How do I know that this new guy, who is slightly cheaper, will be better?
- Our old guy seemed to do a good job, but why hadn’t he mentioned the updates and the need to maintain the site before we asked about it?
- Is there a protocol for changing web maintenance providers? Do I tell the old guy we found someone new before changing his access? What if I do and the old guy gets mad and decides to lock our organization out of our website? Can he do that? Obviously, he can from a practical standpoint, but if he does don’t we have recourse?
- Surely our domain name and content belong to us. What if they don’t? What if they are his because he registered the domain?
- He, won’t do that, he is a professional with a reputation to keep...right?

At this point, I found myself wishing we had had a robust contract with this website guy that laid out all of these responsibilities.

This experience is illustrative of some of the

myriad challenges organizations run into when trying to manage websites and computing related needs. From sole proprietorships to big businesses and every size in between, every organization, whether for profit or not, needs a good website in this Internet age and computers that work. Yet, so many of those in charge of these organizations lack the technical knowhow to understand what computing services are needed to support their business.

When it comes to hiring someone to “do their website” or “fix the computer” they do what most business owners do, they ask around for recommendations. Never mind the fact that their colleagues don’t know what they are looking for either. Once a “web guy” or “IT guy” is found, they hesitate to change because they are captive to the reality that the “website” or “IT” guy can bring their business down with a few clicks. Maybe that isn’t quite accurate, but that is how one of my former bosses treated it.

As I thought about these issues, I realized the power imbalance between the knowledgeable professional and the lay client and the resulting uncertainty in searching for a competent and trustworthy professional were not new problems. In fact, these were problems that I knew well, from my legal training. Many of these issues either ex-

isted in the legal profession and/or were addressed by laws designed to help the public have trust in organizations and professionals. Below are a few different avenues for garnering a more even and trust filled relationship between clients and computing professionals as well as some pros and cons of each.

Contracts

Apart from a few provisions and topics considered to be unconscionable or against public policy, parties can contract about almost anything. Well-written contracts make clear what each party's rights and responsibilities are to the other party. They can be used to clarify the scope of service provided, who owns what and how long the relationship will remain the same.

Contracts are ubiquitous in the computing field and are most often encountered by users in the terms of service agreements that most people scroll through and accept without reading.

Advantages

As mentioned above, contracts are flexible and can cover a whole range of situations and arrangements between parties. Contracts are recognized world-wide and the breadth of contract law backing up the enforceability of a contract (even some oral contracts) can give the parties peace of mind that the agreement will be met. Furthermore, many services are already standard in the industry and professionals providing them can likely put those standards into a boilerplate contract so that both parties can understand better the parameters of the relationship.

Disadvantages

Many parties go without contracts all the time. I am not surprised. Writing a good contract is hard to do without a lawyer and enforcing it without a lawyer is even harder. Why bother entering into a contract with someone if you won't have the ability to enforce it anyway. Contracts tend to favor those who understand them and those who understand the ins and outs of contract law. For example, employment contracts in the technology industry are wrought with provisions that are overly broad and that wouldn't be enforced as written were they ever challenged. Similarly, providers with knowledge might write provisions that their customers don't understand because of the technical details of the service or because they hired a lawyer. Similarly, the lack of understanding, combined with the imbalance of power resulting from the difference of tech knowledge could make it easier for a customer to get out of a valid contract.

Trade-Marks

Trade-Marks are distinguishing features of a product or its packaging that allow customers to identify the source of the product from simi-

lar products produced by others. [1] A trademark that is protected and enforced, allows consumers to quickly recognize the source of the product and judge its quality, presumably based upon past experiences with products made by the same company.

Trademarks can be expanded and used to give the consumer confidence in the quality of a product even if the product wasn't made directly by the company. For example, I may have never eaten a particular brand of hummus before, but if a company I know like Trader Joe's was willing to put their trademark and branding on it, then I can quickly guess it meets a certain standard.

Trademarks are already widely used in the computing industry, particularly when it comes to hardware, but it is a bit more lacking when it comes to finding computer services. If I had a car problem, I might call the American Automobile Association, referred to as "AAA", to get a AAA approved mechanic. If I needed a mediator, I might contact the local or national mediation associations to get approved professionals. If my computer is acting up I might call Geek Squad and have some assurance that the level of service will meet my needs, if I have a certain type of need. What about other computing related services? Is there anywhere I can call to get directed to someone I can rely upon?

Creating a body that provides a list of trusted computing professionals could increase business and trust for the entire profession.

Advantages

Creating a body that provides a list of trusted computing professionals could increase business and trust for the entire profession. This body could also serve the role of educating the public about different types of computing professionals and what their area of expertise is. Smaller businesses or individuals can get more business by being listed by this body.

Disadvantages

This body could end up being more of a gate keeping cash cow than a body that is helpful to individuals. This body could make professionals pay large fees to be listed or could charge customers to get access to the list of trusted professionals. If the body loses its reputation then there would be no advantage to having the body at all.

Licensure and Professional Regulations

Many professions are regulated by the government where they practice, including Doctors, Private investigators, Barbers, Electricians, and Engineers just to name a few. A quick skim of the Colorado Revised Statutes title governing busi-

nesses and professionals, reveals that the general purpose of licensure and regulation is to protect the public by ensuring a level of practice and professionalism that is in the public's best interest¹. Some professions must follow a particular procedure to ensure health and sanitation, whereas others must act with a certain decorum and privacy in carrying out their services [2].

Clients of these professionals can be assured by the presence of a license to practice the given profession that the professional will act in a certain manner, which, in general, will protect them from harm. Likewise, the professionals must maintain these standards or risk losing their license to practice their profession.

Licensure in Computing Professions could provide the assurance to businesses that the professional will abide by certain standards of professionalism, such as informing the customer of an issue that ought to be tended to that the professional has not been asked to fix. Although Software Engineers might have gained an engineering license, the discontinuation of the Principles and Practice of Engineering (PE) Software Engineering exam in 2019 [3] renders this more difficult in many states that rely upon this national exam for their admission of new engineers into the profession. Apart from becoming an engineer, state licensure is not common for computing professionals. I must note, however, that there are private certifications that exist in many specialties, including cyber security that could serve this purpose if they became more known to the public and sought after.

Advantages

Licensure affords the public confidence that a particular professional will follow a certain standard in performing services. Licensure, generally comes with a regulating body that decides the standards, makes such standards available to the public and enforces those standards on the professionals. This process itself can help the profession clarify what it means to be a member of this profession. It can set its own rules of ethics, require ongoing education to keep professionals from getting rusty and even have the ear of the legislature when deciding to pass or not pass laws related to the profession.

Disadvantages

Once again this can turn into a gate keeping cash cow that serves mostly to keep others out and to make money for those in charge. The costs of becoming a computer professional would necessarily increase (even if it were only a small amount) and there would be yet another hurdle

¹Although this information and these examples are taken from the United States and Colorado law, specifically, the purposes are universal when it comes to the need and purpose for licensure, for example.

for those who are impoverished to try to get over. The body who decides who gets licensed could act in a protectionist nature, thus keeping the supply of professionals low, increasing the costs to consumers.

General Practitioner

In many professions, there exists the role of the general practitioner. In medicine this is your primary care physician (PCP) or general internal medicine doctor. In law this is the general practice lawyer or the big law firm that does everything. The role of this person is to directly face with the public, who do not know what specialty expert they do or don't need. This person can fix general issues and can refer to specialists when needed. Such professionals are expected to know other professionals to whom they can make referrals.

This doesn't really exist in computing. Sometimes you will have an IT professional who will offer to refer you to a web developer or web designer, a system administrator or a software developer, but this takes a special kind of IT person who is really listening, trying to fulfill all the businesses computing needs and has a vast network of professionals they know and trust.

Advantages

The not so tech savvy individual would be able to talk to one person who will direct him to the right expert. This model may allow for more specialization in the field as individual professionals feel less pressured to be a "jack of all trades." A referral network can generate business for professionals who the public don't know exist.

Disadvantages

It is unclear who would serve in the role of general practitioner and what "easy" tasks this person would be expected to do. It is also unclear as technology continues to grow whether one person can act in this role for all needs. Finally, this could, as with medicine, turn into a gate keeping delay for one to get to the needed specialist.

Conclusion

To act as though these are the only approaches or that these approaches will solve the myriad of problems in the computing profession would be pretense. As with most complex problems, I suspect that a combination of these approaches and others will be needed in order to truly create a sense of public trust in computing professionals. My hope is that this article and ones like it will

create the catalyst needed to recognize these issues as problems worth addressing and start a conversation about how we might fix them so that the computing profession can grow from its infancy into a fully recognized and respected profession, with all the prestige and confidence that professionalism entails.

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COLUMN

LIFE TURNS FIFTY

Computing History

Mention to computer scientists, gliders, glider guns, birth and death rules and they smile remembering their efforts to study societal life. October marked the 50th anniversary of the publication of John Conway's game of Life in Martin Garner's *Mathematical Games* column [1]. For the lay person with no knowledge of Life, it's difficulty to imagine how popular a single person game with only a single move (i.e. setting the initial conditions) could be.

As a recent New York times article notes, the game of Life has been the focus of over 2000 published article [3], which includes interviews with several people including Bill Gosper, who discovered gliders. He notes, that it took 40 years to discover a "snark", a stable pattern that reflects gliders 90 degrees, and that there are still remaining outstanding questions associated with the game of life [3].

Life's equivalency to a Turing Machine implies that it can simulate any formal computation (with the scope of the Church Turing Thesis). Figure 1 depicts a cellular automaton based on the rules of Life that simulates a Turing Machine [2]. Life has come a long way, happy anniversary.

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In Memoriam

In April 2020, John Horton Conway died of the corona virus [4].



A Life Pattern memorial to Dr. Conway
xkcd



Figure 1. The Complete Turing Machine [2]

CORRECTIONS, REPUDIATIONS, AND REVISIONS: HOW COMPUTING MADE 2020 A YEAR FOR CHANGE

BY
MICHELLE TRIM

Keywords: Misinformation, Language in Technology
Categories: **Social and professional topics** → Computing / technology policy

2020 has been a strange year for many reasons. By February of 2020, the Pandemic was already impacting many parts of the world, and by April, a majority of human lives across the globe were well and truly disrupted by the Covid-19 virus. Some might remember this period as that time when hand sanitizer and toilet paper couldn't be obtained, even at gouged prices. Others may remember this past summer as the time when violence against Black people at the hands of the police achieved a visibility that forced all of us in the US, like it or not, to stop and take note. By the end of the summer headlines heralded what some thought might be the end of the modern university system as colleges and universities across the country announced mass lay-offs and even the dismantling of longstanding majors and departments. Even those with tenure found themselves suddenly without a job. By early fall, the death toll in the U.S. had slowed to the point that schools considered reopening, bars and restaurants unshuttered their doors, and house parties reappeared, if they ever disappeared to begin with. As the positive counts began to surge again, the only thing spreading faster than the virus was misinformation on social media. We end the year in the US with a new President Elect, an emergency approved vaccine, and hope. So many tumultuous events have occurred in this single year that it behooves us to pause for a minute or ten and reflect on what we've learned about the role we want computing to play moving forward.

While Zoom might deserve credit for putting computing literally at the center of many people's lives during the Pandemic, by March, data visualization was a close second as people all over the globe struggled to understand this new public health threat. In fact, Google Trends reports [8] that searches for "Coronavirus" hit peak interest worldwide March 15-21, 2020. For the two weeks following, "hopkins coronavirus," was one of the most popular web searches. The Johns Hopkins

open source Covid-19 data dashboard [11] performed a true public service, providing researchers and visitors with a variety of visualizations enabling people to see trends in daily case counts, areas of greatest infection/impact, and to interact with that data. The dashboard went live on January 22, 2020 and it is managed by Dr. Lauren Gardner, associate professor of civil and systems engineering at Johns Hopkins University. She and her team make all data available for free, including through a Github repository, [7] and by mid April 2020, the dashboard was touted as "one of the world's most authoritative sources for the latest coronavirus numbers and trends" [1]. Providing the public (and researchers, decision-makers, state leaders..etc) with free, high quality data presents one layer of the common good served by this tool. Another layer comes from its design that enables agency on the part of the user to interact with the data, reframing the visualization in ways that suit different cultures and different concerns.

Coronavirus data come from multiple sources, and different locales may use those data in different ways. One thing that stays constant across cultures and state boundaries is the need for accurate data representations, particularly of data that could impact residents' behavior. If positive tests are on the rise, and people get the message that everything is fine and take no precautions, affected communities could see an even bigger spike in infections as a result. Some may find that the case of fired data scientist, Rebekah Jones, has been labeled controversial [13] for her role as a researcher seeking to make data reporting on the coronavirus accurate to the public. She has gained the attention of celebrities and reputable news outlets for her claims during the summer that the State of Florida fired her because she wouldn't "alter the numbers so that the state's positivity rating would change from 18% to 10%" among other changes [17]. Regardless of what people believe are the circumstances of Jones' firing, respected

professors and researchers have recognized Jones' personal data dashboard as being more "comprehensive" than Florida's state website [17]. What this case highlights for computing is the necessity of science being held to an ethical standard of conduct that recognizes an immediate and ever-present obligation to the common good. The shared experience of negotiating this pandemic requires a level of trust in those whose advice we rely on to protect ourselves and our families. That trust is misplaced when entities control what constitutes correct information for reasons other than the safety and well-being of the public.

It is probably uncontroversial to suggest that this social obligation to accurate reporting of information holds true for state sponsored and university venues during a public health crisis. What about social media? This past year we saw Twitter take a decisive stand by flagging misinformation-laden tweets, including those by the President of the United States [6]. They updated their policy on misinformation September 10, 2020 stating that they will "label or remove false or misleading information intended to undermine public confidence in an election or other civic process" [15]. On December 16, 2020, Twitter extended their existing Covid-19 and Coronavirus policies to requiring removal of tweets that "advance harmful false or misleading narratives about Covid-19 vaccinations" [16]. After criticism for allowing misinformation about Covid-19 to spread unchecked, Facebook also has decreed that "[u]sers who like, share, or comment on dangerous falsehoods about Covid-19 will receive a personalized notification from Facebook that tells them it has removed a post they interacted with because it violated its misinformation policies" [2]. It is too soon to tell if these changes by Facebook and Twitter will make a dent in the volume of misinformation spreading online. What is worth noticing, however, is the way that both platforms are starting to take responsibility for mitigating the

SARs-CoV-2 Viron Illustration

(U.S. Centers for Disease Control and Prevention)

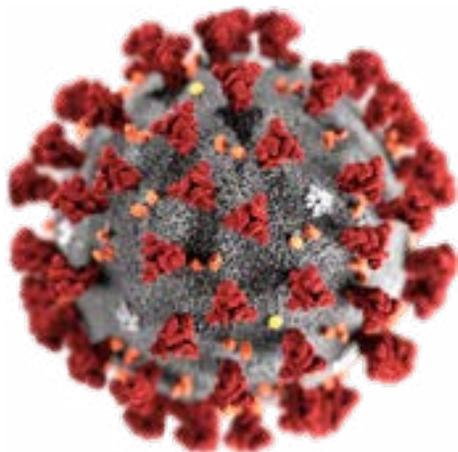


Photo: © Eckert and Higgins
(<https://phil.cdc.gov/Details.aspx?pid=23312>)

public impacts of malignant user activity. Whether it is misinformation about the U.S. election or about vaccines, potentially harmful content is difficult to combat within a click-based profit model [3]. Like a bad accident, problematic content provokes a level of rubber-necking in the form of increased engagement. One of the challenges for computing as a field moving forward will be to help develop tools and applications that build on and aid these efforts.

Big changes can begin with small interventions. While it makes sense that big social media platforms are developing policies for ameliorating potential harm caused by misinformation, other small changes are happening in Tech that combat equally harmful misunderstandings. Python may have started the ball rolling by removing Master/Slave terminology in 2018 [6] but the landslide of Linux [10], GitHub, Google Chrome [9] and others happened this summer in 2020. “Blacklist” and “Whitelist” are other terms that started seeing replacements this past summer as versions of “Blocklist” and “Allowlist” spread across different technologies as more accurate descriptors than their unnecessarily symbolic predecessors. The Master/Slave terminology has been applied to technology since the early 1900s, so while dismantling this language seems trivial on the surface, it has taken a long time to make these changes widespread [12]. And, while some may argue that such changes risk a superficiality devoid of real impact, humans think in language. Using “Main” instead of “Master” is not a cure for racism. But, it is explicitly an anti-racist practice, and as such, I believe it is one small subversion that points computing in the right direction. Similarly, sexist language has been the target of college writing teachers for longer than students have typed their assignments, and yet just recently in 2020, Catalyst has created a Slack plug-in to help combat

it. Catalyst’s Plug-In, #BiasCorrect, “empowers Slack users to fight their unconscious gender bias by flagging it to them in real-time and offering up an alternative bias-free word or phrase” [4]. What other tools can we invent to help remind us of the culture we wish to build?

To appreciate the value of this focus on language in Tech, one has to understand the connectedness of language to culture. Language produces culture and language reflects culture. Without getting too deeply into the theories informing this view, I want to share a particularly elegant way of describing the relationship of language to culture:

“Language is used not just as a tool for the exchange of information, but as a symbolic system with the power to create and shape symbolic realities, such as values, perceptions, identities through discourse” [14].

This quote is explaining that our individual realities are constructed through the language we use to describe them. So, if we associate the notion of Master and Slave with our current reality, we are sanctioning a master and slave relationship as part of our sense of what’s possible in the world. One could say, ‘whoa... hold on there. A slave hard drive is not the same thing as a human slave.’ And indeed, they would be correct on the surface. However, considering the history that rides within those terms, particularly in countries that had legalized slavery in the past, like the United States, those words become symbols that stand in for who those slaves were. That *who* connects those bodies, and the bodies of people who look like them, to this category of “slave.” This same conveyance exists with the term “Master,” and now instead of applying only to harddrives, these words cannot help but also convey the White supremacy that is a legacy of the pre-emancipation era. By no longer using these terms when we want to indicate a dominance relationship between machines or other technologies, we cease to legitimize the institution of slavery as an orthodox expression of power. This correction becomes a rebuke that has the potential to spark cultural change.

As we transition to a new year with all the shininess that comes with it, let’s as a field choose to treat these many rebukes and repudiations as foundational movements of a community coming together at last. Let’s continue to take seriously our social obligation for transparency and accuracy in our representation of information and in our representation of those who can contribute to computer science. Let’s reflect on all the changes, big and small, that 2020 has brought to computing, and let’s make a resolution together that those changes are the small steps of a field beginning an essential transformation into something better than it has ever been before.

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SHORT PIECE

COMPUTER AND SOCIAL SCIENTISTS COLLABORATE TO SOLVE SOCIAL PROBLEMS

BY

TANEY SHONDEL

Keywords: Social and Computer Science Collaboration

Categories: Social and professional topics → Computing Industry

When I have time to daydream, admittedly not often, I imagine the big New York City lawyer's office from Erin Brockovich. The room is huge and overlooks the city. Instead of lawyers around the massive table, there are computer scientists and social scientists. Specifically, Ph.D. candidates and their advisors from top programs in social work, education, criminal justice, public affairs, political science, and computer and data science from around the US.

In October of 2019, I attended CCSC NW in Forest Grove, Oregon. At this conference, they give awards for student presentations. One of the students spoke about a summer research project in Florida in which they studied modalities of whether information dissemination to various populations and their efficacy in reaching at-risk groups. As I walked to my car at the end of the evening it occurred to me that computer science has the potential to have a monumental impact in addressing to solve social problems. I began to review about all of the social problems plaguing our society. The list, of course, is overwhelmingly long. What I know is that there are dedicated, brilliant, and creative social scientists trying to solve our society's most pressing problems. My concern is that they do not fully grasp how computer and data science could help them develop theories and propose better solutions to those problems. Conversely, dedicated, brilliant, and creative computer scientists likely don't have an academic understanding of the social problems we face or how we might endeavor to solve them.

I daydream about bringing these two groups with diverse knowledge together and facilitating their collaboration. I'm neither a computer scientist nor social scientist but I know both. I know them as individuals, and I believe I understand them as a group. I've spent my career in academic publishing and most of the last 15 year in higher education sales which means I talk to educators every day and my strengths are listening, asking questions, facilitating change through understanding, and bringing people together. I'm in no position to suggest how to solve our social problems. In my daydream I connect people and facilitate

their work toward solving our greatest social problems. The goal of my meeting would be for this group to spend several days together talking about their research and their ideas in small and large groups. They might begin to formulate ideas for collaboration on existing or future projects. At a minimum, they would leave the meeting with an understanding. The social scientists would better understand how computer and data scientists can support their research using big data, improving efficiency, and finding hidden connections and thus be prepared to conceptualize future projects with this knowledge. Computer scientists would better understand what the social scientists are doing--what social problems they're working on and why. What underserved communities are they striving to support, what social disparities are they trying to correct? Ideally, partnerships and friendship would form, new projects would be conceptualized, existing research would be enhanced, new ideas, new solutions, new plans would begin to germinate. Of course, at any worthwhile conference, good food and drink would be consumed, and perhaps even some fun would be had.

That's it--that's the whole idea. The problem is that I'm not sure where to start. I joined SIGCAS in the hopes that I would learn about projects already underway and might lend my support. Who is already working with social scientists and needs help? Who would be a partner to help me realize my dream? In which disciplines would the most social good be mined most quickly? What are the problems that would need to be overcome? What don't I know that I would need to know?

It's news to no one that our society is replete with problems to address. As an academic community, we are replete with brilliant and creative young and experienced minds. If we can find the time, space, and willingness to collaborate I believe the seemingly impossible is possible. I believe measurable progress toward a more just, equitable, healthier, and happier society is possible.

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ON DESTRUCTION IN DESIGN

BY
TAPAN PARIKH AND SAMAR SABIE

Keywords: Design, Civic Spaces, Computing Education
Categories: **Social and professional topics** - Computing Professional, Computing Education

Sometimes to build something new you have to destroy what exists. We learned what should have been this obvious fact of existence through our collaboration with a group of 7th grade middle school students that we enlisted in a civic design project. The students were nominally tasked with designing new spaces for inter-cultural communication and public reflection on the small island our university campus shares with a small residential community in the middle of one of the most capitalized urban landscapes in the modern world. Why did it take a group of young middle schoolers to help us as design researchers recognize the significance of destruction as a design move? How can we use this experience to inform our discussion of politics in design, where the interesting question is not whether a design has politics or not, but what politics a specific design proposal does manifest (in this case, the destruction of an artifact), and how such acts can help surface the underlying tensions within a society or community? These are some of the questions that we probe in reflecting on this episode from the perspective of design.

The context for our story is Roosevelt Island - a narrow strip of land situated in the East River between the boroughs of Manhattan and Queens in New York City. This island is home to a small residential community of around 12,000 people, along with Cornell Tech, a graduate campus of Cornell University focused on applied sciences and technology, where we both work. While Roosevelt Island was originally designed as a mixed income community, as with many urban contexts, it has experienced significant demographic and material change in the last twenty years. This includes not only the construction of our campus, but of several residential buildings on the north and south end of the island catering to more upscale and “professional” residents. These changes have generated a decidedly mixed reaction from longer-term residents, who are an eclectic mix of older adults, international diplomats, subsidized housing residents and a significant disabled population.

We discussed some of the history of this community, and how several of our collaborations were and are shaping its emerging relationship with the

new campus in an earlier workshop paper [1]. In this short piece, we reflect on a specific interaction that occurred during the course of a participatory design workshop that we conducted with middle school youth. This workshop was the result of a several months long collaboration with a social studies teacher from the island middle school. In the collaboration, we used the method of oral history to investigate the meaning of home from an intergenerational context, by having students interview their parents or other family or community members about what the word “home” meant to them. Sharing these oral histories in class and on a website created rich opportunities for social and intercultural learning within this diverse urban classroom, which included students with parents from more than a dozen home countries.

At the end of this collaboration, we invited some of the students to participate in a summer internship with us on campus building on the observations from this project to design better civic spaces on the island for intercultural and community dialog. We wanted the students to use their observations from the oral history project to design new spaces that support the kind of intergroup learning they all had experienced in class. Instead, with one exception, the students all started to design various kinds of entertainment, shopping and recreational complexes. While this in and of itself was not surprising, a particular aspect of one design did stand out.

One of the groups had proposed destroying the Octagon, a luxury residential building at the north end of the island, to make room for one such multi-use youth attraction. This was where one of the students (the one that had conformed to the plot and proposed designing a new intercultural learning center) lived, and also where one of us (the professor) lived at the time. When we reminded the students that their task was to build something new, and that there was plenty of other space for their sprawling complex to be located (like on a floating barge in the middle of the river), they agreed that this was a possibility, but persisted in their demand that the Octagon be destroyed.

When pressed on why this was so important to them, the students criticized the building’s “really rich” and “exclusive” vibe, adding that it took up

Roosevelt Island, New York USA



Photo: © Kenneth Wilsey

way too much space (including the pool / garden complex in the back and the tennis course in the front). In addition, many diplomats and other international workers lived in the complex, who did not have to pay their own rent because their embassies or missions paid it on their behalf. In short, the Octagon represented everything they didn’t like about the island - privatized allocation of space, socio-economic inequality and a cultural divide between the high income foreign diplomats and other kinds of residents.

Why were we initially so shocked by this proposal, when it was the one that generated the most discussion, and surfaced important underlying tensions within the community? Our reaction was nothing compared to what happened when the students presented their ideas for feedback at a session with members of the local senior center. These residents, many of whom represented this international community on the island, or were long-time local residents active in the historical society and other civic groups, reacted agonistically and immediately when presented with this idea of destroying the Octagon. One of them responded that if we should destroy anything, we should start with/on our own campus!

What lessons are there to be learned from this tense, often confrontational and seemingly chaotic civic encounter? How does “Design for Provocation” actually manifest in real-world social contexts, with their multiple agendas and real conflicts around land use, resource allocation and inter-cultural dialogue? These are just some of the questions that we probe and reflect upon in a

forthcoming article that discusses this project and its outcomes in greater detail [2]. In this shorter piece, we'd like to use the remaining space we have to reflect on the implications of this incident for the practice of design.

In an earlier article, we discussed some of the challenges of doing civic design with youth [3]. Savvy youth easily see through the redundancy, performativity and fundamental apathy underlying most participatory and civic engagement initiatives. The stark inequalities and bewildering absurdities of the modern state are only too well apparent to them. They realize (maybe better than any of us) that the future presents itself as a set of compromises and zero sum games, where more highly capitalized and better resourced segments of the population (who are usually older demographically) can and will continue to receive more and more of the ecological and economic pie.

What are youth to do in the face of such daunting odds? How can they respond to the stacked deck they have been handed? Of course, by destroying what exists! The history of resistance movements includes such groups as the Luddites, who destroyed machinery as a way of safeguarding the expertise and dignity of working class professions, the Black Bloc, who use nonviolent physical destruction as a way of protesting social and economic injustice, and Punk Rock, which crystallized working class angst through the violation of musical norms around performance and expertise. Youth are often active members of these movements, if not the leaders of them.

Of course, destruction is also implicit in design. Every time we develop a new application, device, building, monument, infrastructure, and so on, we are displacing something (or someone) that existed before it. This displacement has real and material consequences, often as significant as the ones created by the "design" itself. There is a growing feminist movement advocating for our refusal to participate in racist, extractive and socially and environmentally harmful data regimes [4]. We believe that in addition to saying "no" to furthering these harms, we can make intelligent decisions about destroying some of those wasteful and malevolent systems that already exist. This may be especially important in the coming decades, given the decaying nature of so many of our public institutions and infrastructure, and our need to support degrowth and rewilding initiatives.

Given both the practical importance and rhetorical power of destruction in design, why is it so invisible? To us, this is an important theoretical question, answering which can help us fundamentally discern what design is and can be in the future. Maybe even more important though, is to ask the question of what we lose when we ignore the pedagogical and rhetorical power of destruc-

tion in design. Over our many years of working with youth, we have rarely seen them as engaged or have as much agency as when they felt that they had the ability to not only make new things, but also to make informed decisions about what is to be removed. As design practice confronts the many complicated, ambiguous and daunting challenges that we face as a society, the right to destroy needs to be recognized as a part of its collective arsenal.

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NEWS

SIGEnergy Everything

BY DOUGLAS SCHULER

I recently learned that part of my job as SIGCAS Chair was to weigh in on whether an "emerging SIG" should become an active SIG. In early November I was asked to look at the documentation provided by the emerging SIGEnergy. Everything that I saw was relevant and convincing: The potential and need for the new SIG was amply demonstrated. On the other hand, I had the smallest inkling that the SIG could have a bit more CAS sprinkled in with the energy. In general I want to encourage people in the technological world to consider the social world more strongly. It also seemed like a good opportunity to uphold the responsibility of being the chair of this particular SIG. At any rate, I took pen in hand (metaphorically) and wrote to the principals of the new SIG. Along with encouraging words, I made the basic suggestion that the connection of the social (and the environmental) could be made more explicit: I have found that putting that in writing at the onset makes it more likely to be pursued in the present as well as in the future. I also suggested that some SIGCAS members might like to be involved with the new effort. At any rate, the letter that I wrote and the gracious replies from Professors Keshav and Shenoy — including the possibility of a cross-SIG working group, an idea that is close to my heart, can be found at <https://sigcas/SigEnergy>.



NEWS

Smartphone Apps for Covid Vaccination Tracing

[CNN] "Several companies and technology groups have begun developing smartphones apps or systems for individuals to upload details of their Covid-19 tests and vaccinations, creating digital credentials that could be shown in order to enter concert venues, stadiums, movie theaters, offices, or even countries" (<https://www.cnn.com/2020/12/27/tech/coronavirus-vaccine-passport-apps/index.html>).

Ouster of Researcher at Google Draws Scrutiny

[USA Today] "Timnit Gebru says she was fired via email after refusing to retract a research paper that asked tough questions about a type of artificial intelligence, including Google's use of it... Some 2,000 Google employees signed a petition protesting the company's handling of the situation. Academic research called out Google on social media in a rare and widespread rebuke" (<https://www.usatoday.com/story/tech/2020/12/11/google-timnit-gebru-black-employees-diversity-sundar-pichai/3889402001/>).

SMART CITIES: HEADING TOWARD PANOPTICIONS OR SMART SOCIETIES?

BY
ALDO DE MOOR

Keywords: Smart Cities, Technology / Society Trade-off and Collaboration
Categories: **Social and professional topics** → Computing / Technology Policy

Smart cities – which municipal authority does not want them? The complex societal issues – “wicked problems” – of the 21st century really are made concrete at the city level. Whereas politicians in The Hague, Brussels or Washington can endlessly discuss thorny issues like, say climate change, traffic congestion or their own Wars on Drugs, municipal decision makers need to get their act together now. How are we going to heat our buildings in winter and cool them in summer? How can we make city traffic flow more smoothly while emitting less pollution? How can we prevent social disruption due to drug trafficking in the hoods?

The smart cities-concept is promising – or at least promises a lot – in addressing these real and persistent headaches. Two solution pathways are smartly designed physical infrastructure and the effective use of big data, respectively. Road networks are designed differently, homes can be made “intelligent”, the electricity grid smart and drones can help detect criminal activity. However, there is more. In the nightlife area in the Dutch city of Eindhoven, ever more ingenious data-driven technologies are being used to monitor the crowd. If a disturbance is likely to happen, enforcers receive an early warning. Should things still be getting out of control, crowd behavior can be manipulated by situated light and sound effects, and even well-chosen scents. Who could be against this?

At the end of the 18th century, the English philosopher and social theorist Jeremy Bentham proposed the “Panopticon”, a revolutionary prison design. The dome prisons in the Dutch cities of Arnhem, Breda and Haarlem are prominent examples. In a panopticon, a single guard can keep an eye on a complete prison. The idea is that its inmates do not know if and when they are being observed, resulting in them self-adjusting their behavior, “just in case”.

What does all this have to do with smart cities? In the Eindhoven nightlife area case, one could reasonably say that invisible observation of the crowd is in the common interest and the societal benefits outweigh the privacy risks, assuming the right legal checks and balances. Where to draw the

line, however? In China, the largest societal big data project in the world is being rolled out: the introduction of the Social Credit System. Based on a plethora of ongoing observations, citizens receive a personal social reputation score, with a far-reaching impact on their lives. Crossing a red traffic light can already result in penalty points. A low score can negatively affect somebody’s opportunities for getting a job, a loan, traveling and social status.

But something like this would be inconceivable in the West, right? Is that so? Once, I heard a city councilor of a large Dutch city proudly announce that he had signed a letter of intent with a huge Chinese corporation that would build the smart cities-data infrastructure in his city. When asked how the privacy rights of the citizens would be guaranteed, the councilor said that that would sort itself out. After all, in case of privacy violations, citizens would protest and take action. This, however, seems very much like wishful thinking. Such high-tech smart city-solutions comprise the intransparent collection of huge volumes of data, to be processed by very complex algorithms. Often, the results of these ever more advanced analyses surprise even their creators. Who then would still be able to take care of the interests of individual citizens and the common good?

It should be clear that smart cities- with all of their dizzying technological capabilities – should be more than a mass of isolated individuals, to be observed and manipulated by experts and officials from their Invisible Towers. Admittedly, smart infrastructure and big data provide many useful functionalities and are here to stay. There is also increasingly more regulation to address the worst excesses. At the same time, ongoing problems with influencing of elections by social media giants such as Facebook and Twitter show that effective action is not easy to take in practice.

Already in the sixties, the influential German philosopher Jürgen Habermas wrote about the demise of the public sphere, the commons where individuals can freely discuss societal problems from many different perspectives and then influence political action. According to him, causes of

the downfall included rampant consumerism and political control of the mass media by modern capitalist forces, resulting in increasing manipulation of the public sphere. The rise of the Internet only strengthened this process. Dutch opinion leader Jan Kuitenbrouwer even talks about the rise of the “data dictatorship” because of the enormous power wielded by combining big data and social media.

Something is amiss therefore in the smart cities idea. The emphasis now is often on the “smart” technologies, instead of on the “cities” as the melting pots of communities, together forming the local public sphere. The city teems with communities, rooted in neighborhoods, clubs, and associations, nurtured by culture, education, business, all kinds of services, and citizenship. A city connects its communities through its physical compactness and common meeting spaces. Its intelligence is therefore not just defined by its infrastructure and data, but by the combined imagination of the residents and visitors, this amalgam turning the city into a vivacious whole. As in the city numerous local communities meet, intertwine, influence policy making and engage in social innovation they jointly turn it into a “smart society”.

How to support cities as smart societies? One way is to (once more) invest in public spaces and activities which strengthen the connections between local communities. An impressive example is the recently opened LocHal in the Dutch city of Tilburg, a former locomotive revision hall of Dutch Railways, which the public library has turned into the “Living Room of the City” (making it win the World Building of the Year 2019 award). But this is not sufficient. Contemporary neoliberal society is characterized by a strong centrifugal force, which fragments rather than unites communities. Apart from public spaces and community building activities, an active process of reflection is needed. Through such sensemaking, local communities can define their common ground, their common agenda to jointly address the complex problems of their city more effectively.

In Brno – the second city of the Czech Republic – a forward-looking city council started a process



Photo: © Massimo Catarinella
<https://commons.wikimedia.org/wiki/File:KeizersgrachtReguliersgrachtAmsterdam.jpg>

of having a multitude of stakeholders together define a common thematic governance agenda with broad support from its many communities: #Brno2050. To further develop this agenda on an ongoing basis, an experimental process of reflection was started in which community representatives take part, supported by the trusted Brno public library. The first step is visualizing their “collaboration ecosystem” in a participatory mapping process: which organizations and target groups are interested in and working on what themes? In which collaborative activities do they engage? Which resources are available? The next step is to jointly interpret the maps in terms of the actual and potential “connection force” participants detect. What are the issues at play? Which connections are already there, or still missing? What are the priorities? What are the next actions? Who commits to what? This commonly built, used, and maintained “collaboration knowledge base” in this way can act as a driving force in making the city a smarter society.

All over the world, cities are the indispensable engines of societal change. Smart physical infrastructure and big data play an important role. Still, the current focus on these top-down developed and controlled high-tech solutions insufficiently acknowledges the importance of a healthy human public sphere. How to make this public sphere – with at its core a thriving network of local communities – align with an advanced physical infrastructure and ICTs of the city-as-a-smart-society still requires a lot of thought. Will you join us in that quest?

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SHORT PIECE

COMPUTER PROFESSIONALS WITHOUT BORDERS

What Computer Professionals do with their free time? Volunteering

BY

NORBERTO PATRIGNANI

Keywords: Volunteering, Open Source, Healthcare

Categories: **Social and professional topics** → Computing Profession; **Applied Computing** → Life and Medical Sciences Healthcare Information Systems

In November 2005, a group of Italian computer professionals decided to give their knowledge for bridging the digital divide and founded ISF, "Informatici Senza Frontiere" ("IT without borders") [1]. It is a non-profit organization with the goal of providing help to people living in situations of poverty and marginalization. With the main office in Treviso (in North-East Italy) now is present in most of the Italian regions with hundreds of members, men and women. Their activities span from Italy to developing countries, with courses, digitalization of hospitals and social centers, collaborating with schools, universities and prisons, retirement homes for the elderly and applications for people with disabilities. In May 2013 the UN invited ISF to Geneva for the World Summit on Information Society, recognizing its role and what



IT can do for society.

ISF teams have multidisciplinary competences, many years of real world experience and are supporting hospitals in Africa with its flagship project Open Hospital [2]. It is a free and open source software, particularly suitable for people who carry out digital projects in developing countries, it supports functions like keeping track of patient data, visits, hospitalizations, medicines and lab results for better day-to-day management. It was used for the first time in the St. Luke Hospital in Uganda and now in several others. ISF teams intervene also in emergency situations, providing all the necessary assistance for the restoration of IT infrastructures and services.

Digital technologies represent an essential prerequisite for social activities and participation and ISF is the realization, in its highest expression, of the international community mobilized to bridge the digital divide and ensure the most genuine form of democracy. Every year ISF organizes the "ISF Festival" in the city of Rovereto, Italy, where hundreds of members, citizens and students meet to discuss for two days updates about digital technologies, their social and ethical implications and about future projects.

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© ISF: Open Hospital

¹Note: this image was selected by the editor, as not only decorative, but to highlight Amsterdam's use of "smart technology" to power and control city lights. Several descriptions of this effort can be easily found via Internet searches, such as the description at, <https://www.smartcitylab.com/blog/urban-environment/amsterdam-launches-a-modular-urban-lighting-system/>.

IS THERE INTELLIGENCE IN ARTIFICIAL INTELLIGENCE?

BY
MIGUEL ANGEL PEREZ ALVAREZ

Keywords: AI, Education and MetaCognitive Skills
Categories: **Social and professional topics** → Professional Topics, AI Education

I remember reading in my distant youth an FCE book called Artificial Intelligence and the adolescent excitement for the realization of the promises of a world full of automatons serving in all spheres of daily life seemed to be realized. That was the early eighties and the world was not convulsing in the midst of a dizzying technological revolution.

In subsequent years, the possibility of having autonomous systems that would help humans to carry out daily tasks seemed to be dying out. It was not until the beginning of this decade that the push of digital technologies, innovation, miniaturization, the cheapening of more powerful and sophisticated equipment, the supercomputer, the neural networks that imitate the human brain, gave rise to not only hopes but also the promise of have autonomous systems performing tasks originally considered only for human beings.

Some media episodes have aroused not only curiosity but also efforts to gain access to these systems. Artificial Intelligence systems have defeated a world chess champion, participate in quizzes in figurative language like that of the popular television show Jeopardy and defeat their national figures, identify the authors of novels signed with heteronyms, or defeat world champions of the popular game of the Orient Go. All these feats that very few human beings can achieve reveal that the power of these computer systems mimicking the behavior of human beings produces the least perplexity. However, and despite the anticipations of a "Master Algorithm" that in turn elaborates the algorithms with which these systems operate, it is difficult to believe that AI will replace human beings in daily tasks such as caressing with sweet and meaningful words, to whoever requires it and at the right time (the emotionality of the "human factor"). However, non-complex tasks such as identifying random image patterns, determining the identity of a person or the license plates of a vehicle and its owner by their features, or even determining the author of a text by the use of prepositions are tasks that These systems can perform without great effort and in a fraction of a minute, even a few seconds. It is this speed and

these extraordinary achievements that force us to think of autonomous systems as systems that can do tasks intended for human beings. And it is up to that limit that there is the possibility of calling them "intelligent" and "autonomous". Concepts that cannot be accepted from an epistemological or philosophical perspective, since the "decisions" of autonomous systems and artificial intelligence are based on complex algorithms, but not on the awareness of the material and ethical implications of the actions that these systems perform .

On the other hand, the fact that these autonomous systems "learn" (machine learning) in any of its three variants (autonomous, directed and "trial and error" learning) leads us to reflect on the implications that their use will have for our daily lives and for our civilization. Above all, in relation to the new forms of collaboration between men and machines in the short and medium term

Artificial intelligence in school and in everyday life

During the recently ended semester at my university, students worked in my course on the study of interaction with machine learning, new forms of man-machine collaboration, and forms of technological mediation of learning. We analyze how the interaction between students and autonomous systems affects the development of intellectual skills (mainly metacognitive) through artificial intelligence training exercises. The students trained the system in identifying objects in images and identifying colors. From this interaction we were able to observe that just like when boys write algorithms for robots, the artificial intelligence training task allows boys to develop metacognitive skills. This form of collaboration is interesting to think about the role that these autonomous systems will have in the education of our time.

Compete or collaborate with autonomous systems?

The perspective opened by the advancement of artificial intelligence in the administration of systems that control daily life and that many human beings do not even suspect exist forces us to stop

and review how we should actively participate in the process of its adoption. First, we must identify the presence of artificial intelligence and its influence on our daily activities. Second, we must identify the basic elements of its operation (since the complexity of the algorithms that constitute it makes it impossible, even for its creators, to understand many of its "decisions"). And lastly, we must establish the ways in which our civilization must learn to collaborate with intelligent autonomous systems and, better yet, to develop algorithms.

The threat that some see from autonomous systems, artificial intelligence and robots, especially because of their ability to replace drivers, salespeople, teachers, debt collectors and a long list of workers in some tasks, can become the spur and the opportunity to learn how we will create new ways of working in which we master the technique and transform it into a form of fruitful collaboration. The existence of autonomous systems allows us to think and imagine our new tasks, especially as the authors of solutions to old or unpublished social and economic problems. Think about the educators of cyber workers. Educate ourselves for an imminent future.

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AUTHORITARIANISM AND ANONYMITY: CONTINUING TO EXPLORE THE "SCANDAL IN ACADEMIA"

BY

MICHAEL HERON AND PAULINE BELFORD

Keywords: scandal in academia, authoritarianism, collective punishment, brand management, regulation, censorship

Categories: **Human-centered computing** → **Empirical studies in accessibility**; *Accessibility design and evaluation methods*

The Scandal in Academia [32] [33] [34] [35] is an extended fictional case-study intended for use as a teaching and discussion aid for educational practitioners looking to introduce elements of computer ethics into their curricula. Inspired by Epstein [17] [18] it is a full-cycle scenario involving many individuals which touches upon the complexity and interrelations of modern computer ethics. It has been trailed and evaluated as a teaching tool by the authors [36] and with multiple groups since then. However its utility as a general resource is limited without the academic context that supports deeper investigation of the material. It is to address this issue that the authors offer this commentary on the Scandal, with a focus on the ninth and tenth newspaper items presented within. Specifically these are **Culture of Fear and Nepotism at University and Witch-Hunts at the University - IT Crackdown Causes Criticisms**.

In these articles, we encounter the fallout that arrived in the wake of the hacker Nemesis leaking numerous University of Dunglen emails to the press. The article alleges a culture of fear has begun to take hold at the university as the administration over-steers in their response to the growing scandal. There are troubling signs that academic freedom is at stake, and that panic may be creating circumstances under which student rights are being ignored in favour of the attempt to salvage the university's reputation. This is not helped by the fact that Nemesis continues to leak emails into the public record, questioning the fairness and transparency of the recruitment processes at the university and the motivations of the subsequent crackdown.

These incidents raise numerous discussion points for the case study. Within this paper we will discuss nepotism in recruitment, prejudice in hiring, and the extent to which the academic freedom of students, and academics, are supported in practice by their institutions. We'll also discuss the tricky balance universities must walk between the regulation and the enabling of free inquiry, particularly in an age where search-engines are only a few words away from revealing some of the dark-

est contours of extremism. Related to this, we'll also discuss the growing residential component of the modern university complex and how it creates a form of monopoly that disempowers students while underpinning much of the economic balance of an institution.

What Coronavirus has revealed to many people, in many cases for the first time, is the extent to which simple student presence on a campus has on the financial health of the university system. The abrupt shift to remote teaching [7] has been a story of mixed successes and failures [39]. It has also had numerous universities, particularly in the United States, calling out for financial assistance as their hospitality offerings cease to generate sustainable revenue. Battles over the refunding of tuition fees are likely to begin in earnest in the years following the crisis. The cracks in the residential offerings - which include critical infrastructure resources such as library and Internet access - are perhaps more easily exploitable. None of this is settled, and it's likely we will see a number of changes in the relationship between universities, their students, and the economic systems within which both work. It's an age in which we are suddenly hyper-aware of the possibility of global pandemic and some have argued that nothing will be the same again.

As with the previous analyses we have published regarding the Scandal [32] [33] [34] [35] we make no claim that this is the only interpretation that can be placed on the material. Readers are invited, indeed – encouraged, to disagree with any and all of the commentary we provide. This is not intended to be a definitive analysis, but an illustrative one.

Readers are invited, indeed – encouraged, to disagree with any and all of the commentary we provide.

Fear and Nepotism at the University of Dunglen

We should begin this examination of the issues in the Scandal in Academia by addressing the atmosphere at the University, since the social context in which everything is occurring is something that is powerfully influential on the way everyone is behaving. There is much in the way of implication in the statements made by the anonymous students that introduce the article. Particularly stressed are fears:

1. Fear their degrees will be devalued
2. Fear to talk freely due to the suspicion journalists walk amongst them
3. Fear that a secret gossip circle exists in professional emails
4. Fear that free inquiry is being suppressed

These are not unfounded. The value of a degree is adjusted by the perception of worth that others ascribe to it [52] [15] particularly when it comes to job-seeking and career-building. A degree from a high-ranking university is often a prerequisite to be taken seriously as a candidate for some jobs [27]. The disproportionate hold that elite universities and private schools have over some professions [14] [21] [60] are a powerful indicator of the social cache they confer. In more mundane circumstances, we see pressures on students during evaluation exercises such as the National Student Survey to suppress negativity to ensure that the university doesn't drop down league tables, something we have previously addressed in these commentaries on the Scandal in Academia [34]. A degree is a mark of social proofing and if that proof is seem to have come from a tainted source it will not have the same value as it would otherwise. Keeping quiet is a self-preservation tactic in the short-term even if it carries with it considerable long-term disadvantages for individuals and the institution itself [19]. Given the way our Scandal is unfolding, it is reasonable that students would not want to contribute to a situation where every future job interview contains the question 'You went to Dunglen - I heard there was a big problem there during your studies, what can you tell me about that?'. Given the circumstances and



Photo: © Jonut (Flickr)
<https://commons.wikimedia.org/wiki/>

the amount of scrutiny the university is under it is unlikely that there are any formal or official pressures on students to avoid being candid. Self-interest is enough to encourage a measure of discretion.

Given the suspected presence of journalists at the University it is likely that a degree of in-group versus outgroup thinking has begun to take hold [3]. Policies regarding involvement with the press are inconsistent between institutions and even where they are well formed and unambiguous there is often a question mark on how rigidly they can apply to students as opposed to staff. For most members of an academic community this is a small consideration - few become prominent enough to attract the attention of journalists. More commonly, universities and other institutions make use of social media monitoring to track individual commentary, and there are often policies that cover the acceptable use of social media [55] [54]. While institutions lack the ability to censor or control all social media use, some exert specific prohibitions on students when they talk about the university. For example, Nottingham university, at the time of writing, has the following provision in their 'Social Media Policy for Students'¹:

"This policy applies to all students and to any personal communications within a social media platform which directly or indirectly reference the University."

And:

"The University acknowledges that students may use social media in their private lives and for personal communications. Personal communications are those made on, or from, a private social media account, such as a personal page on Facebook or a personal blog. In all cases where a private social media account is used which identifies the University, it must be made clear that the account holder is a student at the University to avoid the impression that views expressed on or through

that social media account are made on behalf of the University"

Policies for staff are inevitably stricter still although the ability for institutions to effectively police either group are limited to the visibility enabled by individual social media platforms. There is evidence to suggest though that these policies are not truly about ensuring the best experience for students and tend to emphasise the rights of an institution to control its own reputation online [48]. Social media is increasingly seen as a branch of marketing for a University [13] [58] [42] and its staff [16] and thus reputation protection and brand management is often the primary driver for these policies. Indeed, when social media activity is deleterious to the brand, more established principles such as freedom of academic expression will inevitably suffer. As Ringmar says, 'The limits to freedom of speech are set by the market'. [57]. Derek Morrison, of the UK's Higher Education Authority (HEA), quoted in [48] says bluntly:

"The simple rule for everyone should be don't affect the share price, no matter what technology you are using."

This is relevant here because social media is a primary tool by which journalists can get access to critical information when investigating an institution of any kind [22] [1]. The often porous nature of the staff/student interface in a university makes this a particularly effective technique. This is an environment full of academics with expertise in non-technical disciplines but limited awareness or experience with online disclosure [45], especially in the face of the 'privacy dark patterns' employed to keep data flowing [6]. This combines with a general apathy about disclosure online amongst younger users [28]. These and other factors mean that journalists can often get access to greater insights that they might otherwise in a locked down information ecosystem. However, the older tools of investigative journalism are just as effective when applied to a university as they are elsewhere - asking questions, making phone calls, and simply hanging around listening to what others say. Permitted presence on campus is technically regulated by an ID card of some kind, but enforcement is often lax except under special circumstances. In all the institutions where the authors have worked, staff cards have generally remained in wallets and the number of times this has resulted in a challenge during the course of regular duties is in single digits. On one memorable occasion, the first author of this paper, dressed in jeans and a t-shirt, needed access to a locked room full of expensive specialist equipment. It was an unfamiliar build-

ing in an unfamiliar part of the campus, but simply going up to the front desk and asking for the key was enough to get access. Even in the absence of any credentials or signifiers of status, However, when a member of the royal family was visiting a different institution staff were denied access to the building and surrounding complex if they could not produce appropriate evidence. This inconsistency of enforcement is itself is a tool that journalists can leverage should they be so inclined. All of this is leaving aside the occasional incidents where leaks are used as a tool in winning internal struggles within a university². The press is a proxy battleground where arguments of all kinds can be fought and occasionally won.

In times of scandal, such as we see here, universities will often take the opportunity to 'remind' staff and students of convenient policies that were never effectively communicated in the first place. Temporary prohibitions may apply, and special instruction may be given. For example during a particularly problematic incident involving the alleged misconduct of a vice chancellor³, staff at the affected university were given explicit instructions about how to identify journalists and how to refer them to the university's PR department in line with policy that had hitherto been under-emphasized.

As such, students are right to be concerned that people may be listening to what they say, and combined with the potential market damage to the 'share price' of their degree a culture of paranoia is not a surprising outcome. This paranoia is fed too by the suggestion in the leaked emails from Nemesis that members of staff are gossiping about people in a way that doesn't exactly meet the general standards for 'professional discourse'. People being people, it's inevitable that this should be true. On one level, it's good practice for staff to cross-talk amongst themselves about individual students - it permits the identification of problems [25], facilitates interventions at the earliest opportunities and generally permits important information to permeate through a faculty. Knowing a student has had a bereavement, even if it is through gossip and back-channels, can be the thing that encourages a lecturer to be additionally and mindfully supportive during an interaction. That in turn can be exactly what a fragile student needs at the time. I can say that most of the 'gossip' I have seen as an academic is positive or supportive - making sure student accomplishments are highlighted within a department, or ensuring the circumstances are known for enhanced pastoral consideration. It certainly can't be argued that

¹<https://www.nottingham.ac.uk/governance/documents/social-media-policy-for-students-nov15.pdf>.

²<https://www.timeshighereducation.com/news/vice-principal-quits-protest-failure-punish-colleagues>.

³<https://www.kentonline.co.uk/canterbury/news/christ-church-university-ex-vice-a56351/>.

all gossip is noble though. It's role as a facilitator of abuse and harassment is well studied [8]. Academics are as predisposed to vent as anyone else. Frustrating interactions with students may result in fiery email chains, or energetic discussion in the staff room. Occasionally these emails make their way into student hands, such as by a lecturer with a particular student on their mind emailing that student directly instead of the colleague that was intended. The impact such accidental indiscretion has on the relationship economy upon which education is built is considerable.

Perhaps the most worrying of the concerns students have is that their ability to freely investigate issues is being suppressed by members of the university staff. Valid, and perhaps entirely innocent, investigation of staff members prominent in the universities is alleged to have been shut down. The implication there is that academic freedom is being suppressed through monitoring and surveillance of student activities. This is likely something counter to the university's own policies regarding acceptable use of university resources as well as the university's legal requirement to support an environment in which academic freedom is protected. However, the latter of these is something that has always, in practice, been secondary to the reflexive instinct of a university to protect itself and its brand [24] [61] [41] [12] [47].

Citing the existence of a policy by itself is often enough to convince people they are in violation given how such policies are often baroquely worded, ambiguously applicable and implicative of dubiously justifiable penalties and dire costs for violation. Social pressures though are powerful, and when instructions to refrain from an activity come from someone in a position of authority - even one as incidental as is bestowed by a lanyard - it can become an issue of over-application. Consider the obvious levels of stress and concern expressed throughout the university at the emerging scandal. We need to decide to what extent students feel empowered to defend the rights they have given those rights are enshrined in a matrix of legal protections, policy specifics, and informal conventions around the academy. Can we simply assume that students in general even know the broad outline of their academic rights?

Important though here in the case study is that these are anonymous comments and thus we have no way as readers to ascertain the validity of the source or the extent to which their comments represent outlier or mainstream perspectives within the university. We don't even know if these comments were provided first hand, second hand, or via an observation of social media discussion.

Much of the information we receive throughout our case study must be assessed in this light. We have addressed this ethical issue in more depth elsewhere in the commentary for this case study [35] but it is something worth re-raising and addressing regularly within this series of investigations. We simply have no way of calibrating the extent to which these views represent a consensus of the student population. We can say though that there are believable real world parallels for why students may be seeking shelter in anonymity at this time.

Systemic Monitoring of Students and Staff

We should return to the issue of student monitoring because in some countries it is now a formal part of a university's legal functioning. In the UK, universities are legally designated as 'specified authorities' under the Counter Terrorism and Security Act (CTSA) - officially known as PREVENT, and thus must⁴:

"in the exercise of their functions, have due regard to the need to prevent terrorism"

What this amounts to is that staff must be furnished with formal training designed to help them identify signs of 'radicalisation' on the campus. Staff have a duty to then report incidences that could be interpreted as leading students down a path that would endorse terrorism or other acts of violence. This is now a contractual requirement of every academic in the UK, with consequent impact on employment if these duties are not carried out. This has, understandably, created an energetic debate about the role universities have in policing acts of speech and the extent to which universities as an institution can ethically designate topics as being off limited for expression. C.f. [23] [10] [26] [59]. That debate is unlikely to reach a conclusion at any time, and the authors of this paper will refrain from commenting one way or the other. Instead, we simply note that this legislation requires a form of systemic monitoring and reporting on certain student activities in a way that can certainly be seen as problematic. In particular, objections have been raised arguing:

1. The specific flavour of guidance provided on the topic is either implicitly Islamophobic, or so general as to be useless
2. Academic staff are not sufficiently trained in issues of counter-terrorism to be able to effectively and correctly identify inciting incidents even with training
3. Implicit biases derived from political sentiment and media coverage mean that PREVENT based interventions are dis-

proportionately based on profiling.

The consequences to an individual academic can be significant. The guidance at the University of Sussex outlines as follows⁵:

"Our policies place a considerable degree of responsibility on you to assess the risks of any event that you organize. In the overwhelming majority of cases, the risk will be negligible and so no further action will need to be taken. However, it is essential that you take this seriously and a failure to comply with your duties will be treated as such. If you aren't sure, you should consult with your Line Manager."

Note here the guideline that 'the risk will be negligible in the overwhelming majority of cases' combined with the note that there are disciplinary issues associated when it comes to incorrectly interpreting often conflicting guidance. PREVENT training undertaken by the first author of this paper was notable for how non-specific it was. When given criteria by which staff might judge whether someone was likely to be demonstrating cause for concern, they included:

1. A change in friend groups
2. Support for causes likely to bring around significant political changes
3. Changes in attitudes or viewpoints

One might note that these criteria apply to a vast majority of undergraduate students at one point or another. Universities were once lauded as one of the places where students do become radicalised to positive change - the genesis or popularization of a lot of popular protest movements is historically within the university campus or through affiliated youth groups [30] [51]. And if we are not educating students to change their viewpoints in the face of evidence, we are failing in our basic duty as educators. The first author of this paper raised these criticisms of the training, pointing out that it just as easily covers being a radical proponent for free tuition as it does someone courting with the principles of domestic terrorism. It was explained later that this was to ensure that the guidance didn't racially profile or religiously discriminate. The cost of that vagueness is that every student is a potential radical and university academics are thus required to report on their behaviour where it is deemed to transgress some invisible and ill-defined threshold of extremity. Training in this incident was anecdotal and purposefully vague, and especially chilling in its implication. Students that feel overly monitored may be justified in their disquiet at this kind of legislation and how it has worked its way into the academy.

At the same time, academics do have a duty of

⁴<http://www.legislation.gov.uk/ukpga/2015/6/contents/enacted>.

⁵<http://www.sussex.ac.uk/prevent/>.

care and were similar guidance to be issued on identifying issues of social isolation, risks of suicide, or harassment it would be difficult to argue that it presents a risk to freedom of expression. It is a difficult argument to make that universities alone should be exempt from counter-terrorism policy by virtue of their largely self-proclaimed status as havens of free inquiry. However, legitimate arguments exist about where the balance lies between coherently addressing issues of violent radicalisation and permitting the 'expression of ideas without risk of official interference or professional disadvantage'.

It would lack nuance for this paper to argue that authority and constraints on freedom of expression are expressed only from top to bottom. While PREVENT and related legislation does apply to staff and the monitoring of student opinions, there is a growing trend of 'no platforming' taking hold in academic discourse. Staff inviting external speakers on a topic may have no PREVENT concerns, but student advocacy has grown increasingly strident in recent years regarding the practice of denying controversial voices the right to speak. The idea was expressed by the National Union of Students (NUS) thusly⁶

"The policy prevents individuals or groups known to hold racist or fascist views from speaking at NUS events. It also ensures that NUS officers will not share a public platform with individuals or groups known to hold racist or fascist views"

"The six organisations currently on the list are: Al-Muhajiroun; British National Party (BNP); English Defence League (EDL); Hizb-ut-Tahir; Muslim Public Affairs Committee; and National Action."

However, this formal and constrained policy statement has inspired similar approaches to those accused of harbouring viewpoints perceived by a critical mass of the student base as abhorrent. These traditionally include homophobia, transphobia, and the expression of principles considered antithetical to progressive thought. An extremely truncated list of people that have faced

deplatforming, successfully or otherwise, in the past few years include:

1. Ivanka Trump, daughter of President Trump, at Wichita State University Tech⁷
2. Feminist icon and author Germaine Greer at Cardiff University^{8,9}
3. Former Home Secretary Amber Rudd at Oxford University¹⁰
4. Breitbart writer and Gamergate provocateur Milo Yiannopoulos at various institutions¹¹
5. Feminist scholar Selina Todd at Exeter College¹²
6. Right-wing author Jordan Peterson at Cambridge University¹³
7. Right-wing author Ben Shapiro at California State University¹⁴
8. Right-Wing author Ann Coulter at UC Berkeley¹⁵
9. Evolutionary scientist and popular scientist writer Richard Dawkins at a radio event in Berkeley, California¹⁶
10. (Breitbart editor and advisor to President Trump Steve Bannon at the Booth School of Economics¹⁷
11. Feminism critic Christina Hoff Sommers at Lewis and Clarke college¹⁸
12. Former CIA director John Brennan at the University of Pennsylvania¹⁹

One might see a trend in this short abridgement. Right-wing perspectives, views from 'the establishment', alt-right provocateurs and scholars that have been critical of gender theory are all regular targets for deplatforming. In many respects, it is a sign of students being taken seriously by academic decision makers in that the expressed views of the student body can influence the provision of a platform to controversial speakers. However, it is also another sign that universities are fiercely protective of their brands - social media pressure is the primary vector by which these protests are organised.

This speaks to a somewhat concerning trend in the academy for those that are inspired by F.

Scott Fitzgerald's assertion that 'First-rate intelligence is the ability to hold two opposed ideas in mind and still retain the ability to function' [20]. Deplatforming essentially removes the opposition from education. It is though inaccurate to say that this represents an assault on freedom since the conflict here is in two fundamentally incompatible conceptions of freedom. One is the freedom to express viewpoints, the other is freedom from the 'harm' of being exposed to those viewpoints. In some cases listed above, the speakers might genuinely be considered extremists under PREVENT and associated programmes. In others, particularly those voices that have been deemed 'Trans Exclusionary Radical Feminists', or TERFs²⁰, it often comes across as more like silencing critical perspectives that are inconvenient or uncomfortable. The Overton window is a way of describing the parameters within which acceptable discussion can take place in a particular society, and it seems Universities are in some cases moving towards a window that is shut more firmly than it is elsewhere.

If one believes that universities should be places where controversial issues are discussed and debated, then unusually it may be the governmental system that comes to the aid of academia. Sometimes perceived as critical of the role of the university in the modern economy, the Conservative government in the United Kingdom has stepped in to create additional room for free speech by issuing guidance and investigating the possibility of strengthened powers for university regulators. Similarly in the US, additional protections for academia are under active discussion. One might cynically note that this has become an issue of increasing importance as these governments have veered ever more to the right themselves - deplatforming after all disproportionately impacts on right-wing voices.

We can conclude from all of this though that monitoring and policing of viewpoints is endemic in the university system, and that it occurs both top down and bottom up. It's a complex issue

⁶<https://www.nusconnect.org.uk/resources/nus-no-platform-policy-f22f>.

⁷<https://www.newyorker.com/news/news-desk/ivanka-trump-and-charles-koch-fuel-a-cancel-culture-clash-at-wichitastate>.

⁸<https://www.theguardian.com/books/2015/nov/18/transgender-activists-protest-germaine-greer-lecture-cardiffuniversity>.

⁹<https://www.newyorker.com/news/news-desk/ivanka-trump-and-charles-koch-fuel-a-cancel-culture-clash-at-wichitastate>.

¹⁰<https://www.theguardian.com/politics/2020/mar/06/amber-rudd-hits-out-at-rude-oxford-students-after-talk-cancelled>.

¹¹<https://www.vox.com/policy-and-politics/2018/12/5/18125507/milo-yiannopoulos-debt-no-platform>.

¹²<https://www.bbc.com/news/uk-england-oxfordshire-51737206>.

¹³<https://www.theguardian.com/education/2019/mar/20/cambridge-university-rescinds-jordan-peterson-invitation>.

¹⁴<https://abc7.com/ben-shapiro-csula-escorted-protest/1219358/>.

¹⁵<https://www.dailycal.org/2019/12/28/uc-berkeley-spends-290000-on-security-for-ann-coulter-talk/>.

¹⁶<https://www.bbc.com/news/world-us-canada-40710165>.

¹⁷<https://www.washingtonpost.com/>.

¹⁸<https://www.insidehighered.com/news/2018/03/06/students-interrupt-several-portions-speech-christina-hoff-sommers>.

¹⁹<https://www.thedp.com/article/2016/04/protests-shut-down-cia-director-john-brennan-talk>.

²⁰<https://www.newstatesman.com/politics/feminism/2017/09/what-terf-how-internet-buzzword-became-mainstreamslur>.



Photo: © Andrew Shiva
<https://commons.wikimedia.org/wiki/>

with no obvious right answers. And perhaps, given the way that student views on freedom are evolving, the university itself must shift with the times rather than hold strong as a bastion for what is occasionally argued as outdated idealism.

Discrimination in the Ivory Tower

The emails that have been leaked by Nemesis within our case study reveal a number of interesting new points of information with regards to the postgraduate students thus far most impacted by the University's disciplinary proceedings. Particularly notable is the email discussion between senior members of the university regarding the recruitment of PhD applicants to Blackbriar's team. When Ian McManus describes the four candidates for the two positions, his notes can be summarised thusly:

1. Sharon McAlpine is as qualified as anyone but she'd also improve the university's diversity profile. Also, 'She's very pretty - she'd certainly brighten up that drab office you keep your students in'
2. Dirk Tumblewood is the Vice Chancellor's nephew, and has an impressive list of contacts and qualifications. Blackbriar surely wouldn't want to get on the wrong side of the principal.
3. James Duncan is blind but a great coder, and he would be expensive to hire given his accessibility requirements
4. Stan Templemore is forgettable.

There's a lot to unpack here. There's casual sexism in the way they describe Sharon McAlpine

along with a nod to tokenism - that she might be worth picking because she's a woman rather than the best candidate. There's ableism and potentially legally actionable discrimination in the way James Duncan is portrayed, explicitly linking his recruitment to the department's budget. We can also note the unsubtle way in which Dirk Tumblewood is linked to the VC with a 'haha, don't upset the boss' comment that could be hand-waved away as a joke. Stan Templemore, in these circumstances, perhaps gets off lightly.

We also see that McManus was right to prep Blackbriar that the VC would not be happy about his nephew being overlooked, especially since the VC is now on record as having stated that he was hoping that the chosen appointments wouldn't work out. Given that these two students were suspended, one could argue a significant conflict of interest is being played out here. Undoubtedly that will be a pillar of the legal case being brought against the university if the lawyer Karan Chandra gets his way.

And yet, while this situation has very poor optics it's also the case that it's compatible in outcome if not in spirit with the expressed goals of almost any public body in the modern age. Almost every university will have a gender equality and diversity policy that is aimed at normalising the balance in the staff base and student body. Given the discussion in the previous section regarding the no-platforming of gender critical scholars, it could be argued in this light that the policy directive to create a welcoming and inclusive campus requires the prohibition of the expression of certain viewpoints. The conflict here comes from the competing goals of creating a space for free intellectual inquiry and creating a welcoming home for minority groups. It is not possible to be both at the same time regardless of the hopeful perspectives demonstrated by surveys of student views on freedom of speech.

However, what these emails show here is an approach to inclusion that is driven more by spreadsheets and statistics than any genuine desire for integration. 'She's very pretty' is the kind of recruitment criteria we might have expected someone to bring up in an episode of *Mad Men* rather than within a professional email between managerial colleagues. Still, the inevitable conclusion of efforts to balance genders within the University system is that gender becomes a powerful 'tie breaker' characteristic in recruitment.

But even with gender diversity programmes codified into most universities working practic-

es, the situation is still hugely uneven. Only four countries in the OECD have a greater than 40 percent proportion of women researchers, and the highest of these 46 percent [2]. In the UK, women represent 38.3 percent of researchers, and in Germany it is fewer than a quarter. Even in the Nordic countries, with their enviable reputation for gender equality, it's still the case that men outnumber women two to one. In Australia, women make up a smaller proportion of senior faculty than men, despite making up a greater proportion of junior faculty [5]. In Canada half of all assistant professors are women but only twenty-eight percent of the professors²¹. In the UK, women earn on average 15.1 percent less than men in the same position for academic work²². In the US, women hold almost half of the tenure-track positions but less than forty percent of the tenured posts²³.

What we see from these statistics is something concerning - that the problems that exist in recruitment are not sufficient in many cases to keep women from entering academia, but systemic issues in the university system prevents women entering the higher ranks of the university system at the rates we should expect. The statistics become even more concerning if we take even the lightest look at intersectionalism where issues of ethnicity, disability and sexuality dramatically impact on progression [11]. We don't even see a person of colour (POC) on the short-list for the positions in our case study. Or at least, we can assume we don't - given the equality comments in the email chain we can be fairly sure that skin colour would have been brought up in the rundown.

The university system values grantsmanship and research output over teaching, pastoral care and service [29] [46] and these are fields that are primarily dominated by male academics as we have seen. We saw the effect of this early on in Coronavirus lockdown, where women academics were expected to shift over to family care while balancing their professional duties²⁴. Men simply aren't expected to participate in this kind of work to the same extent and have thus been free to widen the gap of accomplishment [53]

It is likely attitudes like those of McManus that have a powerful impact on this. Gender equality in many fields is a pipeline problem [44] but not exclusively. It's also an issue where systemic misogyny, racism and homophobia are embedded into the processes and incentives in a way that results in an almost invisible web of complicating factors. Even this is a charitable interpretation and leaves aside the fact that overt displays of discrimination

²¹<https://www150.statcan.gc.ca/n1/daily-quotidien/191125/dq191125b-eng.htm>.

²²<https://www.ucu.org.uk/genderpay>.

²³<https://nces.ed.gov/ipeds/use-the-data>.

²⁴<https://theconversation.com/women-are-getting-less-research-done-than-men-during-this-coronavirus-pandemic138073>.

are still a major problem in the academic system [56] [43] [40] [9] [49]. The problems don't exist only in the faculty. Students are regularly more critical of women in evaluations and more willing to tolerant eccentricities in male academics [50].

Even if Sharon does come out of this situation with a PhD and her reputation intact, which is unlikely as we have discussed in previous analyses [33], academia is an institution where the soft impact of implied sexism is considerable. Unfortunately, other industries don't fare much better - in a 2016 analysis it was found that women made up 47 percent of all employed adults in the US, but held only 25 percent of computing roles [4]. Of those women, Asian women made up five percent of the number and black women made up three percent.

For James, the situation is grimmer still. In 2019 Only 19.3 percent of people with disabilities (PWD) were employed in the US compared to 66.3 percent of those without²⁵. As with the gender pay gap, there's also a disability pay gap. It's approximately 15.5 percent in the UK according to the TUC²⁶. PWDs are more likely to lose their jobs and be denied promotions than abled people. Again, we see in McManus a taste of at least one reason - accessibility compensation is costly and the university system only occasionally has the funding to line up internal development with disability inclusion [31]. Tools, processes and buildings all have to be modified to ensure accessibility for PWDs. While this is often legally required in many cases it's an issue of don't ask, don't tell. If nobody with disabilities needs to use your homebrew software setup, you never need to ask yourself hard questions about the usability of the tools upon which you rely. Bespoke tools are common for analysing results, gathering data points, and running research servers. We don't even know how inaccessible they are because it's a question we simply have not asked ourselves in the literature.

What we do know from the case study though is that the tools James was required to use were not accessible as a rule and required a number of compromises and workarounds before he could access the data he required. And that in turn creates a difficult question for James to answer. 'Should I rock the boat?'. Much as with their self-reported adherence to academic freedom, an implicit rule in academia is that it's a safe-space from which to tell truth to power. Those without a disability have the privilege of not worrying about accessi-

bility, at least until the point they do. That places the burden of advocacy on James who is already in a situation where his personal success in the future, difficult under ideal circumstances, is in the hands of the people to whom he would have to complain. He lacks the career stability and professional security that eases the burden of truth-telling. As such he can choose to make a big thing about the inaccessibility of the tools he has to use. The problem is that he risks alienating Blackbriar and the colleagues that would need to spend time redeveloping tools for which the source code may have long been lost [31]. Or he can tough it out in the hope that he's perceived as someone 'willing to go the extra mile'. If he doesn't keep quiet perhaps when it comes to picking postdoctoral candidates Blackbriar will go with the one that didn't delay the project for weeks or months while the software underwent an accessibility retrofit.

And it's here that we see how these systems create circles of sustaining inequality. Inaccessibilities in the system disincentivise PWDs from taking on research jobs. Because few PWDs are in research jobs, software is written by abled people. Abled people, by virtue of not having to worry about it, often don't consider accessibility as a first-tier design goal. And because they develop inaccessible software, it makes it harder for PWDs to do the jobs for which they apply. Systems of discrimination don't need to be intentionally so to be powerfully impactful.

Systems of discrimination don't need to be intentionally so to be powerfully impactful.

Public Punishments, Acceptable Usage Policies, and the University-Hospitality Complex

The final issue we're going to address here in this paper is the way in which the university has approached its information breach problems through policy setting. One anonymous student (again, always anonymous) has refereed to a 'drum-head trial' of anyone found violating an Acceptable Usage Policy (AUP) that has been recently modified to prohibit a range of activities that had previously been tactitly approved.

In fairness, the AUP of the University of Dungen is not out of line with those of real world institutions. Many of us have signed policies of equivalent wording when undertaking employment or buying an Internet package. However,

the issue here is one of interpretation. 'Material which consumes undue amounts of shared university resources' is one that carries with it a lot of leeway. What is an 'undue amount'? Who decides? And what recourse do students have in the event that they are found in violation of this policy? One must bear in mind that at most institutions students are paying fees which include access to computers, network resources, and storage - to what extent can the university deny them and to what extent is it appropriate that everyone be impacted by the actions of a single individual? Given the student tuition fees are paid as a single bundle without bolt-ins or equivalent, is it fair that a university denies access to one part of a service when opting out was never part of the equation?

The new policy seems to be in response to the leaked emails from Nemesis, which Terry Holmes has claimed are completely invented. However, the service shutdown has impacted on students watching Netflix, playing games, and streaming music. One might argue that these are not necessary activities in an educational establishment, but increasingly universities are tied into the hospitality industry. Dorms, refectories, night-clubs and more are all part of the student provision. Here, students in university dorms - linked into the university network - are now being denied recreation at home on the basis of what's happening in their universities. Coronavirus has shown how much universities depend on the income from these sectors and the battle over refunds is likely to be bruising^{27,28,29}. Students in these circumstances have no alternatives - they cannot simply shift to another provider. The auxiliary fees levied by universities can be considerable - it is hard-baked into the budgetary assumptions under which institutions function. Residential services are usually the largest slice of these auxiliary funding streams, and the fact that they also permit managed control over resources is a valuable benefit. On top of this universities offer campus bookstores, event hosting, on-campus hotel services, parking and vending machines - all of these tie into the operating budget of the institution.

At Harvard in 2019, board and lodging fees counted for almost four percent of revenue³⁰.

Amherst College makes up nine percent of its operating budget for housing related income. In 2018, Smith College in America collected over forty million dollars in residential and dining fees, and that corresponds to approximately sixteen and a half percent of the total revenue for the in-

²⁵<https://www.bls.gov/news.release/pdf/disabl.pdf>.

²⁶<https://www.tuc.org.uk/research-analysis/reports/disability-employment-and-pay-gaps-2019>.

²⁷<https://www.business-standard.com/article/international/covid-19-crisis-angry-undergrads-suing-colleges-for-billionsin-refunds-1200503000181.html>.

²⁸<https://www.insidehighered.com/news/2020/03/13/students-may-want-room-and-board-back-after-coronavirus-closures-refunds-would-take>.

²⁹<https://www.forbes.com/sites/richardvdedder/2018/06/14/why-are-universities-in-the-housing-business/675371c33e9b>.

³⁰<https://finance.harvard.edu/files/fad/files/fy19harvardfinancialreport.pdf>.

stitution. These are substantive revenue streams - the University of Massachusetts is expecting to lose around 70m USD to refunds as a result of Corona³¹.

In our case study Holmes acknowledges some 'power users' will be disproportionately impacted by the policy and that services will be resumed gradually. This is phrased as a kind of hardening of the network to protect it against intrusion. Under-emphasised in the reporting is that Holmes himself said there had been no illegal access of university services which raises the question of the necessity of the restrictions at all.

And again, this is not uncommon in real universities. University networks, already populated by mischievous students and staff, are common targets for external hackers and internal pranks. A university represents an incredibly complex information ecosystem and much of its data is likely to be legally protected or commercially sensitive. Student records, research data, emails, and staff personal directories are difficult to fully protect given the openness of the academic system. Interfaces between public and private services are often points of trouble, and academics must collaborate both nationally and internationally on projects that may involve a baffling array of legal complication and technical compromises. Consider a scenario where a UK academic is using a piece of research software they have written for a Linux server they run. It cross-references student attainment versus social media activity - all ethically above board - and then compiles the analysis of these data points into an interrogable source that can be used for academic publication. And now imagine that they are collaborating with three other academic partners - one in China, one in Sweden, and one in the USA. And then imagine they all need to share equivalent data with each other and have it examined both individually and then in aggregate to explore the link between social media presence and grades.

It's not an uncommon structure for a project, but it's one sufficient to make any security professional, IP lawyer or compliance specialist weep at their desk.

For one thing, given than it's an academic writing the software - how secure did they make it? Does it leave ports open, intentionally or otherwise? Does it expose an API? Is it properly sanitising input? Is it using the latest versions of all its libraries given that most exploits are rooted in pre-existing software packages³²? What software stack does it use and how does it make the connections between the various layers? What tool-chain is used for development and what provision is made for cleaning the outputs?

What of the server? Is this appropriately protected and running a secure OS? Who else is using it and what permissions do they have? Has all the software they have used been secured?

These are not idle concerns. The first author of this paper almost lost a private server to hackers because he had set up a default Wordpress install for the use of someone else and had temporarily set the username and password to the same thing. The result was that hackers used that to gain access to the admin menu of Wordpress, which gave access to the server, which gave access to every piece of software running on that system. There was no legally compromising data on the system, but it did have implications for the research project that the server was supporting [37] [38].

Assuming the software and server are secure - does the data comply with the requirements of applicable legislation? What of data gathered in China and processed in the UK? What of data gathered in Sweden and processed in China? Is it all compliant with EU directives? Is it ideologically compliant with Chinese requirements?

How is the data being sent, and what are the ethical and legal complications there? Is it being sent directly between servers? How, and is it encrypted? Could it be intercepted? How commercially sensitive is it and how compromising would it be for participating research subjects? If it's being transferred by Dropbox or Google Drive or an equivalent - is that even legal in the circumstances?

Given these kind of escalating complexities, and the inability of any one individual to keep on top of them, universities are increasingly moving to a lockdown model of security. They institute proxies that all traffic must go through. They require whitelisting of connections to non-standard ports or enable them only on networks disconnected from the main university. They create or commission their own offerings of tools such as Doodle, Dropbox, Mediawiki and more and then attempt to force academics to use them. The power users that cannot function with the tools provided are assured that their issues are being looked into. Difficulties in collaborating between incompatible software ecosystems are 'being addressed'. The extent to which free functioning of research can work hand in hand with the legal responsibilities of a university is a constant source of friction. Sometimes it is the students that bear the heaviest burden as the debate is worked out.

In this case, what we are seeing is a form of collective punishment expressed through legalese as the universities tries to regain control of a situation that has long ago left them scrambling for an effective response.



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Conclusion

As we progress through the Scandal in Academia we find ourselves permitted greater transparency into what's happening behind the scenes at the University, but we should always be intensely critical of sources that we cannot ourselves validate. We have seen now at least one claim that the emails released by the hacker are fraudulent and have not come from the assumed data breach. However, we must also interpret that in light of a damage mitigation strategy undertaken by the university - we have plenty of reasons to believe at least some of the information is correct but lacking a clear view of motivation it is hard to say how complete a picture we are receiving.

That's an important aspect of this case study - we regularly revisit revelations, characters and the information that has come our way. This is an intentional part of its design - to force us to confront our earlier assumptions and revisit our conclusions. The more we learn, the less certain we can truly be. As we progress really the message becomes 'Nobody is to blame because everybody is to blame', but key here is that this represents not an abnegation of judgement but rather a preciseness of evaluation. There are no true villains here - just people working with different mindsets in systems that require constant compromise. Yes, James was highlighted as a potential drain on university finances, but Blackbriar hired him anyway. That doesn't make James a victim or Blackbriar a hero, especially given the systemic flaws in Blackbriar's supervisory regime and the behaviour of

James in response. People are complicated, situations are fluid, and none of us are ever truly in possession of all the facts.

Modern narratives of blame and responsibility tend to focus on the easy conclusion. A person did something bad and so they are bad forever. A person did something good so we should laud them without criticism. These judgements are notable for how temporary they are - today's hero is tomorrow's villain and there is a real discontinuity in judgement that is violently digital. We do not evaluate action on a spectrum. We judge people on a binary. That's an attitude that is incompati-

31<https://www.bizjournals.com/boston/news/2020/03/27/umass-to-lose-70m-in-revenue-to-student-refunds.html>.

32<https://info.veracode.com/report-state-of-software-security-open-source-edition.html>.

ble with this case study.

As outlined in the introduction, we make no claim that this is the definitive analysis of the two indicated newspaper items. We seek only to offer a lens through which the scandal in academia can be contextualised within its broader context. We seek to demonstrate why each of the individual articles opens up wider and deeper discussions of the issues of modern ethics and the factors that influence them. We hope that this analysis of the scandal helps inform educators looking to use the case study within their own courses.

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*“The more that you read,
the more things you will know.
The more that you learn,
the more places you’ll go”*
– Dr. Seuss

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DESCRIPTIVE AND PRESCRIPTIVE SOFTWARE: A SOCIETAL CHALLENGE?

BY RICHARD BLUMENTHAL

Keywords: Software, Neutrality, Bias, Prescriptive and Descriptive
Categories: Social and professional topics - Computing / technology policy

Every few months or so since graduate school, I encounter new circumstances that remind me of the relation between the descriptive and prescriptive approaches humans use to understand and navigate the world in which we live. My most recent reminder occurred while reading about bias in software and efforts by researchers to reduce the negative impacts of this bias on society by (re) designing algorithms to address such biases as gender, racial, age, etc. Typically, "software bias" arises from using a descriptive model of human behavior within a prescriptive program.

Given my new reminder, I began to wonder whether the position of simply removing such biases from software applications, for example, was too simplistic. Perhaps a better understanding of the descriptive and prescriptive nature of software might better serve society when attempting to address software bias? The remainder of this Parting Opinion presents an initial inquiry into this possibility. To give the reader a better understanding of the nature of descriptive versus prescriptive software, I begin with three demonstrative examples.

The Structure of Programming Languages

Phrase structure grammars [8] are used by computer scientists to describe and prescribe the syntax of programming languages. As an example, consider the syntax of simple arithmetic expressions, as modeled by the following grammar [1],

```

expr → expr op expr
expr → (expr )
expr → id
op → +
op → -
op → *
op → /

```

If you're familiar with such grammars, feel free to skip ahead to the next paragraph. The previous grammar consists of seven rewrite rules that can be used to exchange the left and right side of the rule, delimited by the arrow, by simple symbolic substitution. The symbols appearing in italic typeface indicate phrases of the language defined by the grammar, while those in roman type represent the lexemes ("words") in the language.

Phrase structure grammars can be used to either generate or recognize "sentences" in a language. For example, the previous expression grammar

could be used to describe the following expression, (subtotal + tax)

where "subtotal" and "tax" correspond to legal ids in the grammar. For programming languages with C-like syntax, the previous grammar not only describes the grammar, but it also prescribes the legal syntax of such an expression. Any expression not adhering to this grammar is considered syntactically invalid. As a counter example, the following Lisp expression would be invalid,

```
(+ subtotal tax)
```

Of course, the prefix nature of Lisp expressions could be specified by a different expression grammar containing the following alternative rule,

```
expr → ( op expr expr )
```

The key point in the previous examples is that the same grammar rules are used as both a descriptive and a prescriptive model of a programming language's syntax. In fact, the precision required when developing a program for subsequent execution requires the ability to prescribe its behavior. For example, there can be no ambiguity in the meaning of a programming language statement since every statement must prescribe a specific execution intention. This prescription requirement approach is not true for all uses of grammar.

The Structure of Natural Languages

Unlike programming language grammars, caution must be taken when using descriptive rules to prescribe the form of sentences in natural languages, such as English. To appreciate the distinction, consider the following sentence, which was taken from a Website suggesting you should avoid sounding like a chimp by avoiding grammatical errors by following the "correct" prescriptive rules of English grammar [24],

"If I was rich, I'd buy lots of peanuts."

From a prescriptive perspective, the previous sentence is ungrammatical since it makes a hypothetical claim, which represents a subjunctive mood and implies the verb 'were' in English, as in,

"If I were rich, I'd buy lots of peanuts."

Of course, if I were to utter the previous "ungrammatical" sentence, you would still easily under-

stand my intended meaning and should be able to give a grammar rule that describes my sentence construction. This distinction between what I did utter and what I should have spoken is addressed by the "linguist" Steven Pinker,

"The rules people learn (or, more likely, fail to learn) in school are called *prescriptive* rules, prescribing how one "ought" to talk. Scientists studying language propose *descriptive* rules, describing how people *do* talk. They are completely different things, and there is a good reason that scientists focus on descriptive rules" [18].

Pinker uses numerous natural language examples that demonstrate the difficulties of using grammar in an overly prescriptive fashion and concludes,

"Many prescriptive rules of grammar are just plain dumb and should be deleted from the usage handbooks."¹

Not convinced, let's consider one additional, albeit, famous example presented by Pinker,

"Space – the final frontier ... These are the voyages of the starship *Enterprise*. Its five-year mission: to explore strange new worlds, to seek out new life and new civilizations, to boldly go where no man has gone before."

I wonder how the estimated \$4 billion Star Trek franchise [20] might have fared had the prescriptive rule that English sentences cannot end with a preposition been followed?

The Structure of Office Work

By the mid 1970s, several research efforts were focused on using software to automate the flow of work in offices [N], which, in turn, requires developing models representing the processes and objects involved. An example of this early is the OfficeTalk "workflow" application developed at Xerox PARC and its underlying Information Control Network (ICN) model [9]².

In its simplest form, an ICN defines an office as a set of procedures where each procedure consists of a set of activities and associated data repositories, as depicted in Figure 1. Activities are tempo-

¹I had the privileged of extending ICNs in my dissertation work under the guidance of Ellis and Nutt, at the University of Colorado, Boulder.

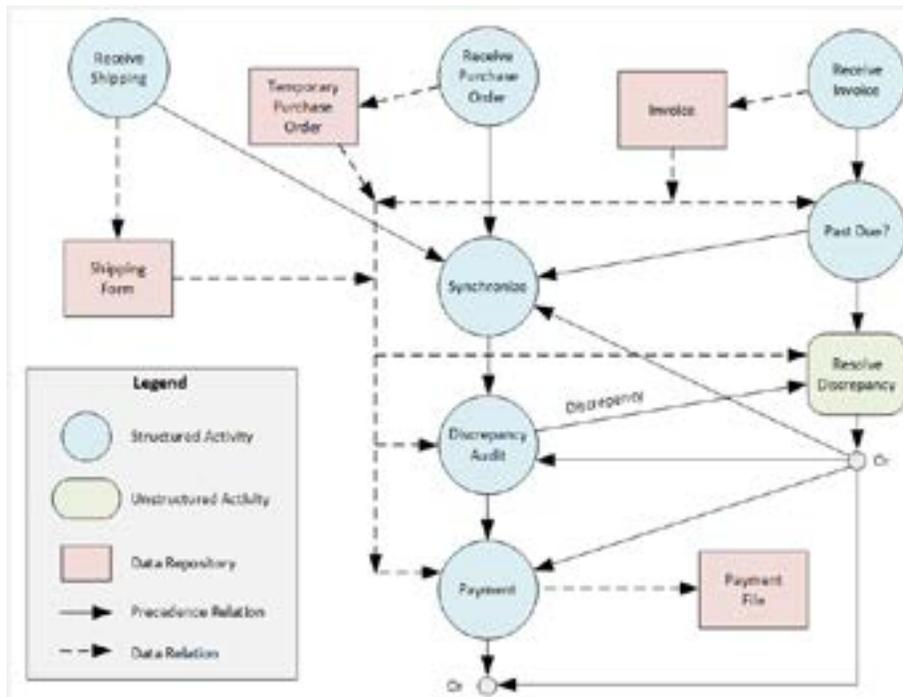


Figure 1. Semi-Structured Information Control Network (ICN) [5]

rally ordered by precedence constraints (directed relations) indicating that the activity at the head of the relation must be completed before the activity at the tail. Activities represent tasks that must be done as part of the office procedure. Small circles depict forking, joining, and synchronization of parallel activities. The reader is referred to the references for additional details and the formal specification of an ICN [N] [E].

Although the ability of ICNs, and other process-based workflow models, is impressive, their use in office environments quickly revealed issues with using descriptive models (e.g. the ICN) to prescribe actual office work. We can use the ICN shown in Figure 1, and the associated office procedure it models, to highlight a few of these issues.

The ICN depicted in Figure 1 represents a procedure taken from an accounting office case study in which the workers were "charged with maintaining controls on cash disbursements for several facilities of large a corporation" [S]³. Ignoring, for the moment, the rounded unstructured activity in the ICN of Figure 1, the remaining activities capture the idealize mainline flow of activities within this office procedure. The primary responsibility of the office workers was to ensure the information in the purchase order, invoice, and shipping form, which may be received in installments, is consistent before payment is issued. Discrepancies occur for a myriad of reasons and Suchman's case study examines the actions of various workers in the office trying to understand and resolve such discrepancies (e.g. missing purchase orders). The

actions performed by the workers to understand and resolve discrepancies is convoluted, at best.

Such tasks were identified as unstructured [E] since they're associated process was either *ad hoc*, couldn't be specified by subject matter experts in the office [5], or the result of too many exceptions to the mainline process [19]. Such "unstructured activities" led to Suchman to observe that

"the smooth flow of office procedures is an outcome to which practitioners orient their work it is not the work itself" [21].

which she subsequently developed into the more general theory of situated action noting,

"A point of departure ... is the idea that common-sense notions of planning are not inadequate versions of scientific models of action, but rather are resources for people's practical deliberations about action. As projective and retrospective accounts of actions, plans are themselves located in the larger context of some ongoing practical activity" [22].

The key point is that similar to the use of descriptive grammar to prescribe actual utterances, caution must be taken when trying to use descriptive specifications of actual office work to prescribe exactly how the work should be carried out⁴.

Historical Societal Perspective

Naturally, the impact of using descriptive and prescriptive models on society didn't begin with the advent of computing. In fact, societal examples date back to the beginning of written history. Examination of a few of these examples will fur-

ther set the stage for our examining how we might wish to deal with software bias.

Historically, the distinction between descriptive and prescriptive models manifests in the form of "what is" and "what ought", respectively. Consider the Hammurabi "law" (c. 1745 BC) [14],

"if anyone hire oxen for a year,
he shall pay four gur of corn for plow-oxen"

or the common moral imperative to

"respect your elders"

in world religions and cultures [3] [11] [15] [17].

It's easy to imagine that such prescriptive imperatives arose from descriptive situations in which an undesirable outcome occurred by not respecting one's elders or an injustice from failing to pay the appropriate amount for the use of oxen. It's also easy to imagine that people recognized the tension that was created when such prescriptive imperatives were proposed. We will leave it to others to argue whether the Magna Carta (1215) limiting the English king's ability to carry out arbitrary laws or the Protestant Reformation (c. 1521) against the established cannon of the Catholic church constituent failed prescription. Or in a similar vein, whether the symptoms of Trichinosis (a description), led to dietary prohibitions on eating pork (a prescription). Interestingly, science appears to play a role in the continued acceptance of prescriptive rules (i.e. the role of Trichinella parasite was discovered in the early nineteenth century leading to a wider acceptance by many that pork was safe to eat, when thoroughly cooked)⁵.

Software Bias

The last decade has experienced a significant increase in software bias as machine learning algorithms are applied to the increasing plethora of data available on various human behaviors. As a characteristic example, consider N-gram language models, which use similarities among words to make various probabilistic predictions [12]. In turn, these probabilities are learned from large corpora of real-world sentences to learn probabilistic similarities among words. One such approach is the so called Word-to-Vector (word2vec) neural network architecture, which characterizes the similarity of one billion words trained from six billion tokens appearing in a Google New corpus [16]. The word2vec designers note,

"somewhat surprisingly, it was found that similarity of word representations goes beyond simple regularities... it was shown for example that $vector("King") - vector("Man") + vector("Woman")$ results in a vector that is closest to the vector representation of the word *Queen*" [16].

³Suchman was a colleague of Ellis and Nutt at PARC and I recreated the ICN, as part of my dissertation.

⁴Various techniques to address this issue have been proposed, starting points include [5] [7] [19].

⁵We are not intending judgment of any religion or society; only that these historic examples occurred.

Not too shabby since the algorithm could intelligently answer an analogy type question of the form, "Man is to King as Woman is to?".

The algorithm also learned a lot of other questionable relations, for example, to a query like "Man is to Computer program as Woman is to?" the software response would be "Homemaker" [6]. As another analogous example, consider an Internet search using a person's first name, which result in delivering content. Such searches have been found to be racially biased suggesting, for example, that a person with a name of "Latanya Farrell" resulted in an advertisement with an incorrect suggestion that she may have been arrested, while search on the name "Jill Foley" resulted in neutral ad [23]. Clearly an example of software exhibiting a racial bias. As a final example, The machine learning algorithm Amazon was creating to evaluate software engineering candidates "penalized resumes that contained the word women's, as in 'women's chess club captain,' and downgraded candidates who listed the names of two particular all-women colleges" [13].

The bias in these examples wasn't created by the software, but instead reflects the inherent bias in the data used to train these algorithms. In the context of this Parting Opinion, a descriptive model of the data. However, once incorporated into the software using the learned data, it becomes prescriptive; either prescribing what to do or making predictions of how one ought to act. We do not take this claim of prescription lightly. Namely, we simply do not accept that organizations should be allowed to hide behind the fact that they are only making recommendations since a recommendation is a belief in how one ought to act. However, we also do not deny that the software is reflecting the broader nature, perhaps, of society and that is the crux of the matter.

A Societal Challenge

Given the bias creeping into software from a descriptive analysis of the raw data of human behavior from which the underlying algorithms were trained, researchers have begun efforts to remove such bias (e.g. [2] [13]). We find it useful to partition these efforts into two categories. The first corresponds to sampling error, where bias is a result of using an inappropriate sample space. In facial recognition software, for example, using training data that only contains images of ethnically white people. We can imagine situations in which it may be appropriate to limit the sample space of the training data, but then we would ask, *shouldn't the application inform users of this?* The second category, which is of more interest, includes attempts to remove the inherent bias from the descriptive data. Then we ask again *shouldn't the application inform users of this?* since the underlying algorithms are now manip-

ulate data in a manner that falsely presents the data, which violates "fostering public awareness of computing, related technologies, and their consequences [2].

We believe a more pertinent question is *should software describe society or prescribe how society ought to be?*

If we believe software could change society for the better by removing such bias from the descriptive data, then we need to ask whether such a "cleansed" descriptive model could change human behavior by allowing people to only interact with prescriptive software that never exhibits, for example, bias. There is evidence that people will often assume that computers/software knows better than we do and blindly follow software

Should software describe society or prescribe how it ought to be?

recommendations, see [10] for examples). Either way, we need to use caution with such an approach since it is possible that such prescription will fail and then we are simply sugar coating society. For example, if software continues to exhibit bias, perhaps this will better motivate humans to remove bias from society instead of pretending it isn't there, as reflected in our software.

The choice is ours; how should we proceed?

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