Annual Report of the

ACM Committee on Computers and Public Policy (CCPP)

For the Period 1 July 2017 to 30 June 2018

Submitted by Peter G. Neumann, Chairman

Purpose of CCPP

The ACM Committee on Computers and Public Policy (CCPP) seeks to

 \* aid the ACM with respect to a variety of internationally relevant

 issues pertaining to computers and public policy, and

 \* help make the ACM even more well recognized worldwide.

CCPP's most visible project is the ACM Forum on Risks to the Public in Computers and Related Systems, established in August 1986 in response to Adele Goldberg's ACM President's message in the February 1985 issue of the Communications of the ACM (CACM). It has also served as a hands-on review board for the 244 Inside Risks articles in the CACM (now in the Viewpoints section), since July 1990.

CCPP Committee Members

The Chairman of the ACM Committee on Computers and Public Policy (CCPP) is Peter G. Neumann. During the entire reporting year, the committee consisted of Steve Bellovin, Peter Denning, Virgil Gligor, Kevin Fu, Nancy Leveson, David Parnas, Jerry Saltzer, Lauren Weinstein, Zeynep Tufekci and Ben Zorn.

See the following section titled Diversity of CCPP for more on their backgrounds and contributions.

CCPP acts as an expert advisory group rather than a general membership organization. It appears to have considerable impact worldwide, even though it maintains a relatively low profile. I am extraordinarily grateful to those CCPPers with continued long-standing participation, and look forward to the new additions. Since 1990, CCPP has had an incisive role with intensive reviewing of CACM Inside Risks columns and has also helped resolving occasional potentially sticky issues relating to the ACM Risks Forum. The intellectual memory span and diversity of interests that the CCPP group represents and is contributing is really extraordinary, and has ensured the high quality of the Inside Risks content, as well as helping me keep the ACM Risks Forum on a sound track. I continue to value their incisive contributions on many issues that require insight and wisdom.

Although their oversight efforts regarding Inside Risks are often not visible to readers, some of the CACM columns have emerged only after intense interactions with the authors, and in some cases escalated into coauthorship.

CCPP internal interactions generally involve e-mail, with occasional telephone calls and in-person discussions. Many constructive interchanges have occurred during the reporting year, as in the past.

There is some overlap with other ACM committees. Although there is some commonality of problem areas, the charters of CCPP and USACM are quite different. USACM has a specifically U.S.-centric focus, whereas CCPP tends to consider problems more generally, with a broader scope of topics, and with a truly global perspective. Neumann remains active in USACM committees, including risks related to election systems, which is a common interest of USACM and CCPP -- with primary domestic and international scopes, respectively. Peter Denning has provided some coordination between CCPP and ACM's Ubiquity.

Diversity of CCPP

Many of the CCPP members have been with us for decades, with minimal turnover. Steve Bellovin was added a decade ago and Kevin Fu in 2013, each to continue bringing in new blood and to increase diversity. During most of the 2016-2017 ACM year, David Parnas was the only non-US member, and Nancy Leveson the only woman. Several of us have been on multiple National Academies study groups. Having previously been the Chief Technologist of the FTC, Steve Bellovin is now on the NSA Advisory Council. Nancy Leveson's ongoing work is having a major impact on system safety. Kevin Fu has been particularly active in bringing concerns for security into the medical safety communities, which adds significant expertise and breadth to CCPP.

He has received an award for that work from the Association for the Advancement of Medical Instrumentation. Lauren Weinstein continues his active relevance to network neutrality and privacy, among other areas.

David Parnas has been particularly helpful in keeping us on point, and will once again be a contributing author for the October 2017 Inside Risks article. Even though retired, Jerry Saltzer still makes incisive contributions based on his extensive system and security experience. Virgil Gligor has been relatively busy on other efforts during the past year, but is still a vital contributor. Our newest members are Zeynep Tufekci and Ben Zorn, both of whom joined CCPP in June 2017. Zeynep is an Associate Professor in the School of Information and Library Science at the University of North Carolina. She is the author of Twitter and Tear Gas: The Power and Fragility of Networked Protest, and is an incisive contributor to the Op-Ed pages of The New York Times. Ben Zorn works for Microsoft. Extending his contributions to computer science, programming languages, and memory security, Ben has recently been actively involved in public policy. Each of them has special interests and experience that are vital to our diversity and to the overall charter of CCPP.

Several CCPPers are academics who have had extensive experience in industry.

Overall, we represent significant topical breadth and depth, and yet seek further diversity. The basic criterion for the committee is that it should span a long intellectual history going back to the early days of the ACM, while also being able to go with the flow in terms of continual advances in technology and social implications -- albeit with a relatively broad scope of what might be relevant to computers and public policy issues that are global and not just U.S.-centric.

CCPP Efforts

CCPP has several primary manifestations, including

\* RISKS online: The ACM Forum on Risks to the Public in Computers as a newsgroup (a digest by e-mail, and distributed as comp.risks via USENET). See Item 1 below.

 \* RISKS highlights in ACM Software Engineering Notes (SEN), edited

 and distilled from the online ACM Risks Forum. See Item 2 below.

 \* The CACM Inside Risks, now with scheduled tri-yearly columns. See Item 3 below.

 \* RISKS: The Book, Computer-Related Risks. See Item 4 below.

Neumann has been highly visible in those efforts, but other CCPP members have also been active participants. Additionally, some other efforts have been undertaken, and CCPP members have continued to be active in ACM advisory roles and in computer policy issues, either directly related to CCPP or otherwise.

Neumann contributes many hours each week pro bono, moderating RISKS, commissioning and editing CACM Inside Risks articles, responding to queries, engaging in individual dialogues with readers, and distilling the RISKS highlights for SIGSOFT's Software Engineering Notes (SEN). From the feedback we receive, RISKS appears to be one of the most widely read and most useful of the moderated on-line digests relating to computer technology. It serves a vital educational purpose. Despite its high profile and occasionally controversial nature of some of the material, RISKS has been a relatively noninflammatory operation; this reflects the fact that Neumann takes his moderator's role quite seriously. The advisory members of CCPP are invoked as informal reviewers whenever a potentially controversial contribution must be considered, and they are consistently cautious in representing ACM's interests -- as I believe am I. In addition, each member of the committee has typically played an advisory role during the year on various sensitive issues.

Overall, CCPP represents an extraordinary collection of creative thinking ability and resources for ACM, and its members are invoked as appropriate.

Relevant Activities During the Reporting Year

Following is a list of CCPP-relevant activities. Almost all were done essentially pro-bono, and in my case with the considerable blessing and computer support of SRI International's Computer Science Lab -- for which I am hugely grateful, and with external pro bono support from Lindsay Marshall at Newcastle (see Item 1).

Items of Immediate Relevance to CCPP

1. The on-line ACM Forum on Risks to the Public in Computers and Related Systems. In addition to various unofficial mirrored sites on the Internet, including a feed at panix.com for comp.risks on USENET as of the official archives are available by anonymous ftp in the U.S. at ftp://ftp.sri.com/risks/ , and in a nicely formatted searchable site in the U.K., courtesy of Lindsay Marshall: <http://catless.ncl.ac.uk/Risks/>

which is also accessible (without the search facility) <http://www.risks.org>

The ACM Risks Forum activity involves many tens or even hundreds of thousands of people around the world, some of whom are contributing to the CCPP effort through their RISKS submissions. There are always many new first-time contributors each year.

The ACM Risks Forum continues as an institution. Since its first issue on August 1, 1985, its readership continues to expand, with a steady flow of new direct subscribers, via USENET newsgroups as comp.risks, and through redistribution centers and mirrored websites throughout the Internet. It reaches essentially every country that does not censor the Internet.

During the 2017-2018 ACM reporting year, 38 issues of the ACM Risks Digest appeared (RISKS-30.36 to 30.73). Although the number issues was fewer than in previous years, the size of each issue tended to be much larger, because of limited available time slots to create each issue.

The number of submissions for consideration continues to be considerable, and the primarily limitation on the frequency of issues is the scarcity of my time. (Sometimes as much as 90% of all mail that arrives in my RISKS mailbox at risks@csl.sri.com is spam, \*after\* pre-filtering. However, that is not a problem, because regular readers have been trained to include a magic string in the subject line of

genuine submissions, almost all of which are generally considered for inclusion. Inclusion rates vary with the relevance of the topic.)

2. Highlights from the on-line RISKS Forum now appear four times each year in the ACM SIGSOFT Software Engineering Notes. (In 2017, SEN was transformed to a quarterly instead of a bi-monthly.) Neumann was SEN's founding editor in 1976. After Will Tracz took over as Editor in 1995, Neumann continued to contribute a RISKS section to every regular issue, which now continues under SEN's fourth editor, John Georgas John.Georgas@nau.edu. (SEN's circulation is one of the larger among SIGs.)

3. P.G. Neumann (ed). Inside Risks began in July 1990 as a monthly one-page article, originally inside the back cover of the CACM for 18 years. It became slated for three longer articles each year in 2009.

We continue to seek diversity among the authors and the content. The following articles appeared (or were written) during the reporting year, as Inside Risks Viewpoints:

\* Oct 2017.242. The Real Risks of Artificial Intelligence:

 Incidents from the early days of AI research are instructive

 in the current AI environment, David Lorge Parnas.

\* Feb 2018.243. Risks of Trusting the Physics of Sensors: Protecting the

 Internet of Everything with embedded security, Kevin Fu and Wenyuan Xu,

 <http://www.csl.sri.com/neumann/cacm243.pdf>

\* Jun 2018.244. Risks of Cryptocurrencies, Nicholas Weaver

 <http://www.csl.sri.com/neumann/cacm244.pdf>

All Inside Risks articles since December 1997 (and a few selected popular earlier ones) are available online at <http://www.CSL.sri.com/neumann/insiderisks.html>

4. Neumann's RISKS BOOK ("Computer-Related Risks", ACM Press and Addison-Wesley, 1995), having transcended its fifth printing, is now being printed "on demand", and is available online as well. Used copies sell for as little os $0.01. It is also available in a Japanese translation. More recent source material is online in the ACM Risks Forum <http://www.risks.org> culled, excerpted, and to some extent indexed in a topically relevant form bimonthly in SEN (item 2). As noted last year, the thought of

producing a second edition was dispelled after the retirement of Peter Gordon, as the online Risks Forum and the online RISKS highlights in Software Engineering Notes are widely accessible.

What is to me most frustrating is that most of the content of the 1995 book is still valid today. Many of the problems discussed there are still recurring, and many of the recommendations for doing better seem to have been widely ignored. (NOTE: Used copies are available for as little as one cent on Amazon.)

5. PGN's Illustrative Risks document provides a topical index for early SEN and RISKS issues. It used to be updated periodically, and is fairly complete up to the point that it became too difficult to maintain.

It is available online: <http://www.CSL.sri.com/neumann/illustrative.html/>

 <http://www.CSL.sri.com/neumann/illustrative.pdf>

<http://www.CSL.sri.com/neumann/illustrative.ps>

The task of maintaining the currency of this resource has become more daunting over time, and this index is not up to date -- except for recent items on election integrity. However, the search engine at

risks.org tends to compensate for that, and the accessible information in item 5 makes that less necessary. However, it is still valuable as a source of references for earlier RISKS material prior to the Internet.

More recent quasi-indices can be found in the RISKS highlights in each issue of Software Engineering Notes (Item 2).

6. Numerous additional activities of PGN are enumerated in Appendix I below.

7. Lauren Weinstein continues his operation of the PRIVACY Forum and the Network Neutrality Squad under the partial aegis of CCPP.

 PRIVACY FORUM: <http://www.vortex.com/privacy>

 NETWORK NEUTRALITY SQUAD: <http://www.nnsquad.org>

The Privacy Forum and related services from People For Internet Responsibility (PFIR, which he co-founded with PGN), and his other outreach efforts continue to provide discussions, information, and other services that include the many areas of privacy -- which intersect virtually every aspect of our lives. The PRIVACY Forum, Network Neutrality Squad, and his other archives are continually referenced

around the world, and have been listed as major network resources in the links of many private, commercial, and governmental entities globally.

As is the case with PGN, Lauren receives numerous e-mail and telephone contacts from all manner of media points, and continues to participate in newspaper and magazine articles, local and network radio and television interviews, and similar discussions on privacy and related technology topics. He has also been a commentator for National Public Radio's ``Morning Edition'' and for "Wired News" regarding technology and society.

8. Other CCPP members have also interacted with various ACM people on ACM and CCPP-related issues, reviewed drafts, refereed papers, etc. See their websites, listed in Appendix II.

9. Other CCPP members wrote papers and gave talks that bear on computers and public policy.

10. This CCPP annual report is accessible from the acm.org pages, via a link to my CCPP Web page:

<http://www.CSL.sri.com/neumann/ccpp.html>

Related Papers

Published papers from my ongoing joint SRI-University of Cambridge DARPA project were noted in previous years' reports, and linked on my website.

Our hardware-software total-system architecture can provide unprecedented trustworthiness, including greatly reducing security risks. (It seems worth mentioning here as something highly relevant to RISKS readers who worry about the future resembling the seriously vulnerable state of the art today.) Our 2016-2017 papers relating to that project include two new ones:

11. Alexandre Joannou, Jonathan Woodruff, Simon W. Moore, Robert Kovacsics, Hongyan Xia,

Robert N. M. Watson, David Chisnall, Michael Roe, Brooks Davis, Peter G. Neumann, Edward Napierala, John Baldwin, A. Theodore Markettos, Khilan Gudka, Alfredo Mazzinghi, Alexander Richardson,

Stacey Son, Alex Bradbury, Efficient Tagged Memory, International Conference on Computer Design, ICCD 2017, Boston, 5-8 November 2017.

12. Robert N. M. Watson, Peter G. Neumann, and Simon W. Moore, Balancing Disruption and Deployability in the CHERI Instruction-Set Architecture (ISA), in New Solutions for Cybersecurity, Howie Shrobe, David Shrier, Alex Pentland, eds., MIT Press/Connection Science: Cambridge MA.

(February 2018).

13. Peter G. Neumann, Fundamental Trustworthiness Principles, in New Solutions for Cybersecurity, Howie Shrobe, David Shrier, Alex Pentland, eds., MIT Press/Connection Science: Cambridge MA. (February 2018).

14. Robert N.W. Watson, Jonathan Woodruff, Michael Roe, Simon W. Moore, and Peter G. Neumann, Capability Hardware Enhanced RISC Instructions (CHERI): Notes on the Meltdown and Spectre Attacks, Technical Report UCAM-CL-TR-916, Computer Laboratory, University of Cambridge, UK, February 2018.

<https://www.cl.cam.ac.uk/techreports/UCAM-CL-TR-916.pdf>

Plans Through 30 June 2019

Neumann plans to continue moderating the on-line ACM RISKS Forum, and to continue contributing condensed highlight summaries of the ACM Risks Forum to ACM SIGSOFT's Software Engineering Notes.

Neumann, with significant help from the CCPP group, will continue to coordinate/edit/write the CACM Inside Risks columns, seeking articles on topical RISKS-related subjects written by members of CCPP and other contributors. (Please contact me if you think you might have an appropriate relevant Inside Risks Viewpoints article.)

Some CCPPers will continue participating in USACM. We continue to encourage submission of more Inside Risks columns from the USACM community, even though we try to keep the international focus.

Budget and Funding

The 2017-2018 CCPP expenditures were as usual minimal, and the budget was adequate, with no expenses for computing resources and communications (all contributed pro bono). SRI continues to provide free disk space for the RISKS FTP archives at ftp.sri.com; the CSL.SRI.COM resources are partly subsidized by SRI. In addition, Lindsay Marshall at Newcastle University provides the extremely useful searchable risks.org archives on a pro bono basis, and with the blessing of his university. I use my personal cell phone and free home phone extensively. We appreciate ACM's past support, and have been happy to stay within budget each year.

Summary

The ACM RISKS Forum, the monthly CACM Inside Risks columns, Illustrative Risks, and the related efforts have continued to be successful in achieving their intended goals, as well as being highly popular.

We note that several related efforts are already ongoing under the aegis of the External Activities Board or USACM committees. For example, the scientific freedom and human rights, legal, education, and USACM committees involve issues relevant to CCPP that frequently are discussed in the ACM Risks Forum from the RISKS perspective. We are happy to interact with others in those related areas, without CCPP having to be directly in the loop, and to offer the Inside Risks space to those efforts that have a reasonable RISKS-relevant content. Overall, CCPP seems to be usefully situated in a well-defined niche of its own.

The ACM RISKS Forum and the PRIVACY Forum/NNSquad/PFIR items span a large gamut of CCPP issues, and reach out to many thousands of people, throughout the world, quite a few of whom are actively contributing participants. RISKS is heavily involved in human safety, privacy, ethics, legal responsibility, election integrity, and so on, and there is no shortage of public-policy related issues! In addition, the Inside Risks articles continue to serve as a popular CACM feature, and distill a diverse collection of timely topics on computer-related risks in a broadly accessible and carefully vetted and edited form.

Continued support of existing and possibly new CCPP activities is appropriate, and will be appreciated at essentially the same level. We are delighted to be a low-budget high-yield part of the visible ACM output.

The CCPP members represent a valuable cross-section of ACM interests relating to public-policy issues. All of their efforts in helping CCPP and the ACM are greatly appreciated, even though many of those efforts are not noted here explicitly.

We would be delighted to receive further suggestions for new directions relating to computers and public policy, internationally relevant initiatives that we might address beyond the ACM Risks Forum and the CACM Inside Risks columns, and ideas for making our efforts even more visibly attributable to ACM without compromising the special role of CCPP.

Respectfully submitted,

Peter G. Neumann,

Chief Scientist, Computer Science Laboratory,

SRI International EL-243, Menlo Park CA 94025-3493

E-mail address: Neumann@CSL.SRI.COM or pneumann@acm.org for nonbusiness related communications

Web site: <http://www.csl.sri.com/neumann> Office phone: 1-650-859-2375

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Appendix I: CCPP-Relevant Activities of Peter G. Neumann

RELEVANT PGN EVENTS, July 2017 -- June 2018

 [Severely restricted because of workload.]

Second half of 2017:

 \* Mo-Tu 4-5 December, Layered Assurance Workshop, Orlando FL, organizing

 committee, panel chair. This workshop (long associated with ACSAC) had a

 ten-year lifetime, and was dedicated primarily to high-assurance

 composable trustworthy systems for safety, security, ultra-reliability,

 and other critical requirements. With dwindling attendance, it has been

 discontinued for 2018, although its organizers are contemplating a less

 specialized approach for the future.

First half of 2018:

 \* Mo-We 21-23 May, Attended the 39th IEEE Symposium on Security and Privacy

 (Hyatt Regency, San Francisco), for which PGN is the only remaining

 attendee from the first one in 1980, having attended roughly 3/4 of the

 39 meetings.

 \* W 6 June, Attended the Electronic Privacy Information Center's Champions

 of Freedom evening ceremonies, at which Matthew Dunlap (Maine Secretary

 of State) and Alex Padilla (California Secretary of State) received the

 Champions of Freedom Award, primarily for their stellar roles in election

 integrity. Neumann received the EPIC Lifetime Achievement Award (whose

 previous awardees since its creation in 2012 were Willis Ware, Whitfield

 Diffie, David Flaherty, Anita L. Allen, Bruce Schneier, and Christopher Wolf).

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Appendix II:

Current Web and Internet Addresses for CCPP Members

<http://www.CSL.sri.com/neumann> (Peter G. Neumann)

**pneumann@acm.org** (and **Neumann@CSL.sri.com** for SRI-related e-mail)

<http://www.columbia.cs.edu/~smb> (Steve Bellovin)

<http://cs.gmu.edu/cne/denning> (Peter J. Denning)

**pjd@nps.edu**

<http://www.eng.umd.edu/~gligor> (Virgil Gligor)

**virgil@andrew.cmu.edu**

<http://web.eecs.umich.edu/~kevinfu/> (Kevin Fu)

<http://spqr.eecs.umich.edu/> (Kevin Fu's group)

**kevinfu@umich.edu**

<http://sunnyday.mit.edu/leveson.html> (Nancy Leveson)

**leveson@mit.edu**

<http://wapedia.mobi/en/David_Parnas> (David Parnas)

**parnas@mcmaster.ca**

<http://web.mit.edu/Saltzer/> (Jerry Saltzer)

**saltzer@mit.edu**

<https://sils.unc.edu/people/faculty/zeynep-tufekci> (Zeynep Tufekci)

**zeynep@unc.edu**

<http://www.vortex.com/privacy.html> (Lauren Weinstein)

**lauren@vortex.com**

<https://www.microsoft.com/en-us/research/people/zorn> (Ben Zorn)

**benzorn@acm.org**