

Cyber Security and Privacy Research Institute

THE GEORGE WASHINGTON UNIVERSITY

**Cross-Disciplinary Collaboration in Cybersecurity:
A Workshop Report**

**Lance J. Hoffman
Laura Brandimarte
Lynette Osborne**

Abstract

This is the report of a workshop that brought together social scientists, computer scientists, and others funded under a “new collaborations” program. It summarizes issues articulated and discussed at the workshop, describes lessons learned from mixing the disciplines, and suggests future efforts to improve cross-disciplinary collaboration.

May 20, 2016

Report GW-CSPRI-2016-02

**Support for this research was provided through the National Science Foundation
Division of Computer and Network Systems, Secure and Trustworthy Cyberspace
Award 1551194**

Table of Contents

1	BACKGROUND	1
2	GOALS OF THE WORKSHOP	1
3	WORKSHOP PROCESS	1
4	OBSERVATIONS	2
4.1	Signals of quality in interdisciplinary research	2
4.2	Facilitating and incentivizing interdisciplinary interaction in cybersecurity and privacy research.....	3
4.2.1	Interdisciplinary interactions and communications	3
4.2.2	Funding incentives	4
4.2.3	Issues with tenure and promotion criteria.....	5
4.3	The whole is greater than the sum of its parts: contributions of discipline-oriented cybersecurity and privacy research	7
5	A TOOLKIT FOR INTERDISCIPLINARY RESEARCHERS IN CYBERSECURITY AND PRIVACY	8
6	SUMMARY	10
7	ACKNOWLEDGMENTS	10
	Appendix A: Workshop Agenda	11
	Appendix B. Participants	12

Cross-Disciplinary Collaboration in Cybersecurity: A Workshop Report

1 BACKGROUND

Over the past three years, the Secure and Trustworthy Cyberspace (SaTC) program of the National Science Foundation has funded about 50 Early-concept Grants for Exploratory Research (EAGER) projects bringing together social scientists and computer scientists, who had not previously performed research together, in new collaborations. The Workshop on How to Create Lasting Relationships Among Computer Scientists and Social Scientists brought together researchers from many of these projects on January 21, 2016 for individual presentations and group discussions on how to better foster interdisciplinary research collaboration in cybersecurity and privacy. The great majority of participants came from NSF EAGER projects that had two principal investigators, one from computer science or a related field, and one from a social science. Almost all attendees were principal investigators (PIs), but in some cases other research scientists attended from these projects.

2 GOALS OF THE WORKSHOP

This workshop was designed to identify:

- measures of success and challenges in working on interdisciplinary projects (e.g., institutional barriers for interdisciplinary collaboration, ease/barriers to publication, ease/difficulty of attracting/retaining students);
- barriers to submitting in response to (and being funded by) traditional solicitations;
- emerging concerns associated with interdisciplinary research partnerships; and
- areas where further collaborations would be worthwhile.

3 WORKSHOP PROCESS

The Workshop began with an articulation of the associated goals of the project as described above. In the initial plenary session, the project facilitators, Prof. Lance Hoffman (the principal investigator) and Prof. Laura Brandimarte went over the workshop agenda (see Appendix A) with the participants, a list of which is given in Appendix B. To provide everyone with context of the SaTC program, two cognizant program directors from NSF (Heng Xu and Nan Zhang) and their predecessor (Jeremy Epstein) then explained their relationship to the program and their interest in the progress of this workshop, as well as results developing from it. To familiarize everyone with the types of interdisciplinary projects that the research pairs were engaging in, each dyad presented an overview of their funded project, and primarily focused on the successes and challenges of their own

interdisciplinary research in cybersecurity and privacy. Many of these presentations are available at the project's website, www.cspri.seas.gwu.edu/lastingrelationships.

After this initial plenary session, the workshop continued in three structured breakout sessions to encourage problem-solving around common themes and associated questions that emerged during presentations in the initial plenary session. While many topics were discussed, three main themes emerged:

1. Signals of quality in interdisciplinary research
2. Facilitating and incentivizing interdisciplinary interaction in cybersecurity and privacy research
3. Identifying gaps in discipline-oriented cybersecurity and privacy research

The participants were divided into three teams and asked to contemplate these topics and explore them in their breakout sessions.

4 OBSERVATIONS

When everyone reconvened from the breakout sessions, the three teams each reported highlights from their discussion of their assigned area of concern. Reported highlights presented by breakout session representatives can be found below followed by overall observations from the concluding plenary session.

4.1 Signals of quality in interdisciplinary research

The discussion about “Signals of quality in interdisciplinary research” revolved around two concerns: common language and funding.

Common language. A barrier exists when one community is expecting language that means something specific to their discipline but may mean something different, or lack meaning, to others. This can create challenges, especially when research in the different disciplines is just as rigorous but the perception of rigor varies depending on the terminology used. For instance, one theme that often resurfaced was recognition by peers, especially as it relates to journal reviewing, tenure, and promotion decisions. Not having a common interdisciplinary language in cybersecurity and privacy can lead to misunderstandings, even ignorance of certain elements that one discipline may see as basic. These misunderstandings can then lead to invalid assessments of the quality of both research and researchers.

Funding. Funding was also discussed as a potential signal of quality. In some institutions, funding tends to be viewed as a signal of quality research, but in other institutions or departments, funding is not viewed as particularly indicative of the

value of the research endeavor. Similarly, some disciplines (most social sciences) use acceptance of articles submitted to journals or published books as a proxy for high quality research, while other disciplines (especially computer science) use acceptance of articles submitted to peer-reviewed conferences or workshops.

Interdisciplinary research, by its very nature, requires stepping out of one's field of research and therefore also requires some extra effort, compared to traditional disciplinary research, in order to obtain recognition of quality. Participants provided a useful list of possible indicators that could be used to assess the quality of interdisciplinary research across fields. This list includes, but is not limited to language and funding concerns:

- Federal or other kinds of national funding: while some departments may not base tenure decisions on obtained funding (and, in fact, may even lack the administrative structure that is necessary to both submit and receive/manage grants and awards), the fact that a research project obtained national recognition through funding is a clear sign of quality;
- Journal Publications: while obviously not perfect, Impact factor, Journal rankings, and acceptance rates are measures of academic readership and influence which indirectly provide a universally understandable signal of quality of published research;
- H-Index: another objective measure of quality is the author-level index of productivity and impact;
- Acceptance rates (or the competitiveness of different NSF programs measured as the percentage of all submitted proposals that were awarded grants);
- Adoption of a particular solution described in a research project (e.g., a technique, a product) by one or more organizations, either commercial or governmental;
- broad adoption by the general population;
- media coverage.

4.2 Facilitating and incentivizing interdisciplinary interaction in cybersecurity and privacy research

In order to address the structural barriers that exist in facilitating and valuing interdisciplinary research, three main topics were discussed: better ways of interacting and communicating, funding incentives, and issues with existing models of tenure decision.

4.2.1 Interdisciplinary interactions and communications

Another way to address structural barriers may be to develop and maintain a list of interdisciplinary collaborations, funding opportunities, publishing outlets, and conferences in cybersecurity and privacy. Some of these may also serve to identify additional signals of quality, since strengthening the community of interdisciplinary research also means getting exposed to different models of evaluation, thus learning how to properly assess interdisciplinary researchers.

To better communicate the value of the research at the intersection of computer science and social sciences, it might be useful to identify some theoretical frameworks that researchers in both disciplines are familiar with. These crossover frameworks may be interesting to consider for the advancement of interdisciplinarity in general, but also specifically for the work of the PIs who participated in the workshop. For example, cybersecurity and privacy interactions involve both social science and computer science, but generally graduate departments do not train their researchers to be flexible enough to handle both aspects. In fact, becoming versed in both may not be possible, both because of time and financial constraints. How should we train graduate students effectively and efficiently, so that they can do interdisciplinary work without having to become experts in more than one field?

One way to possibly foster collaboration and interdisciplinarity without having to train students in more than one discipline is letting them focus on a specific topic that is interdisciplinary by nature (like most privacy and security topics are), allowing them to explore the different ways in which various fields have tackled that topic. Looking at a specific topic from different angles would broaden a student's understanding of the problem, and it would open the possibility of collaboration with others holding different perspectives.

4.2.2 Funding incentives

Some changes in funding requirements and mechanisms may also play an important role in breaking down barriers to interdisciplinary research. Some NSF programs, for instance, could be slightly altered to provide a more favorable research environment for interdisciplinary cybersecurity and privacy researchers:

CAREER grants are the National Science Foundation's most prestigious awards in support of junior faculty "who exemplify the role of teacher-scholars through outstanding research, excellent education and the integration of education and research within the context of the mission of their organizations." The CAREER program might be a very well-suited mechanism to encourage crossdisciplinary research, especially because of its prestige. If NSF were able to add a significant sum to a CAREER grant for a project that addressed interdisciplinary cybersecurity questions, it would spur research in this field even more.

EAGER grants are those with exploratory work in its early stages on untested, but potentially transformative, research ideas or approaches. This work may be considered especially "high risk-high payoff" in the sense that it, for example, involves radically different approaches, applies new expertise, or engages novel disciplinary or interdisciplinary perspectives.

INSPIRE grants are those exploring scientific advances outside the scope of a single program or discipline, such that substantial funding support from more than one program or discipline is necessary. Their lines of research promise transformational advances.

These grant programs seem particularly relevant if it is desired to increase interdisciplinary research. Other forms of supplement awards to encourage interdisciplinarity might be important as well, including postdoctoral scholar support, whereby new researchers gain valuable training related to asking and answering cross-discipline questions as a way to establish themselves. This would allow them to buy time and make investments to launch an interdisciplinary career in a new way.

Another suggestion was to require interdisciplinary advisory panels at proposal preparation time, or project execution time, or both. This would be much like a current NSF requirement of an evaluation component being included in many proposals.

4.2.3 Issues with tenure and promotion criteria

When it comes to tenure decisions, some departments have a well-defined way of evaluating a researcher, based on specific criteria, which do not allow for incorporating elements such as broader impact of interdisciplinary projects. Even the fact that interdisciplinarity calls for multiple authors on papers could represent an obstacle in cases where a department emphasizes solo work. Encouraging more flexible criteria for promotion and tenure decisions would facilitate interdisciplinary research.

The interdisciplinary community should find effective strategies to mentor young researchers with an eye on the pitfalls to promotion and tenure, so that their careers are not jeopardized by the limitations in the evaluation of their work. The existing structure that privileges sole author publications in highly ranked journals does not seem to promote the advancement of interdisciplinary work in security and privacy. One way to change this is by finding, developing, and promoting different kinds of outlets, specific for interdisciplinary work.

Furthermore, longer tenure clocks, (e.g., 9-year), which allow for the tenure review process to focus on “impact” of the research, may represent a starting model that motivates and incentivizes broad, challenging multi-disciplinary collaborations. Relying exclusively or primarily on the signal provided by the journal in which the work is published may underestimate the contribution of interdisciplinary work. One possibly better model includes faculty reviewers who are assigned either a “pro” or “con” perspective as they assess the junior faculty member’s dossier. In this way, multiple views of the junior faculty member’s work necessarily emerge, which leads to a more complete evaluation of the faculty member’s work. Similarly, basing reviews on the researchers’ top five publications (as identified by the outlet in which they appeared and the number of citations they

obtained), instead of the entire CV, may be a better method of evaluating tenure candidates, as it would help assess the actual impact of the research.

Another problematic aspect of the traditional ways of assessing interdisciplinary faculty performance and potential is the perceived value of interdisciplinary research outside of the home institution, which is a priority as researchers seek to obtain appropriate credit from reference letter writers. In fact, even finding reference letter writers versed enough to appreciate the work of interdisciplinary researchers may be difficult. This is a challenge that extends beyond tenure review processes and into student advising and mentoring: How should one advise graduating doctoral students, who dedicated themselves to interdisciplinary work but may have to face a job market composed mainly of institutions that do not currently value interdisciplinary research? Even in cases where a school values interdisciplinary research, they may not recruit explicitly for interdisciplinary researchers. Indeed, some institutions may not hire newly minted Ph.Ds with degrees from interdisciplinary schools, preferring instead non-interdisciplinary graduates with an interdisciplinary outlook. This creates an additional challenge for graduates on the job market and, at the same time, may stifle the development of interdisciplinary research. Non-interdisciplinary graduates are arguably more likely to keep working in their own field rather than experimenting with interdisciplinary work for the first time once they become junior faculty and face the pressure of their tenure clock ticking.

An additional challenge interdisciplinary researchers have to face, given the current traditional models of tenure review, is that they may be expected to be experts in multiple fields. Rather than requiring expertise in two or more disciplines when researchers engage in interdisciplinary work, it might be more appropriate to expect researchers to demonstrate that the work has made a unique and impactful contribution at the intersection of those disciplines.

Positive movement toward valuing and promoting interdisciplinary research may already be inevitable. Several university-funded internal efforts for research on interdisciplinary problems already exist, and some universities are hiring interdisciplinary faculty. Others are recognizing the value of interdisciplinary research in their strategic plans and internal initiatives.

Some positive movement has occurred in breaking down structural barriers to interdisciplinary research. In 1999, a letter was published¹ from the Computing Research Association (CRA) as an insert in Computing Research News for non-Computer Science schools; it explained that Computer Scientists often do not publish in journals, and using that criterion as the only or primary way to evaluate their research was harmful not only to them, but consequently to the field as a whole. Perhaps similar letters should be offered that discuss critical issues associated with hiring, promoting, and deciding on tenure for junior faculty who wish to pursue their careers at the intersection of multiple fields,

¹ See http://archive2.cra.org/uploads/documents/resources/bpmemos/tenure_review.pdf

specifically cybersecurity and privacy. Such letters may constitute a way to share disciplinary expectations, if not harmonize them to some extent. Such letters might also facilitate departments and research centers to build a common language of interdisciplinarity, allowing for more accurate and fair assessments of interdisciplinary researchers. Which individuals or organizations should generate such letters remains an open question.

4.3 The whole is greater than the sum of its parts: contributions of discipline-oriented cybersecurity and privacy research

A breakout session originally intended to identify gaps in discipline-oriented cybersecurity and privacy research ended up providing a rationale for doing interdisciplinary cybersecurity and privacy research, noting that research areas and topics that are inherently characterized by elements of both social science and computer science, such as cybersecurity and privacy, could not be explored, understood and enhanced if interdisciplinary work was not being conducted. Attacking such issues with inadequate historical and technical background and with an incomplete arsenal of technical and administrative tools would not be successful. Furthermore, common tool building and sharing would be occurring much less frequently, and the growth of a community interested in working on such relevant issues would be hampered and slowed down.

Conducting interdisciplinary work for the cyber-world also has important implications for society at large. By suggesting and discussing their societal implications, interdisciplinary work brings issues of privacy and security, which may otherwise remain the domain of a few technical computer science experts, to the attention of the public. Such interdisciplinary work has the capability of showing how seemingly (merely) technical aspects of privacy and security can actually help humanity establish values such as human rights and democracy.

Interesting questions regarding collaborations between academics and non-academics also came up in discussions. What about projects with non-academic professionals from the industry, such as privacy practitioner lawyers and corporate lawyers who are members of the International Association of Privacy Professionals (IAPP)? They have the potential of adding a valuable practical perspective to cybersecurity and privacy research, but collaborations between academics and these figures do not seem encouraged in the current model of interdisciplinary work. Similarly, should we encourage more use of professional system architects and developers, such as those that work for major firms like Apple and Google and smaller ones like Palantir and Fireeye? Would the participation of non-academic professionals enhance results? Would their participation be unduly influenced by corporate interests? Could their participation provide additional funding for significant interdisciplinary research in cybersecurity and privacy? Would getting corporations that provided these researchers to value these contributions be any different than (the problem of) getting universities to value the interdisciplinary contributions?

5 A TOOLKIT FOR INTERDISCIPLINARY RESEARCHERS IN CYBERSECURITY AND PRIVACY

One of the objectives for this Workshop was to suggest solutions to problems that are common to many researchers who embarked on projects of an interdisciplinary nature. The lively discussions during the Workshop led to a collection of useful suggestions, which could be summarized in a “toolkit” for interdisciplinary researchers. This toolkit includes the following do’s (and don’ts), broken down by categories related to interpersonal interaction, developing (graduate) students, and publishing and communicating results.

Interpersonal Interaction

- **Align interests:** When starting an interdisciplinary project, researchers should make sure that their interests are not competing, and that they can articulate one or more shared professional goals beyond the advancement of science in general.
- **Take time to make sure everyone understands each other: Being open to learn:** humility is a quality that, almost by definition, characterizes good science, as scientific knowledge progresses by putting one’s hypotheses to the test, but this is especially true in interdisciplinary research, where researchers from different fields come together. Collaborators should acknowledge their own limitations, so to learn and embrace other perspectives. In this regard:
 - Conversation/communication is key
 - Jargon should be avoided, especially early in the process, and the use of real world examples should be encouraged, in order to better communicate issues to researchers from different fields.
- **Have frequent interactions with your fellow researchers:** It is crucial to the success of interdisciplinary work that interactions among collaborators be frequent, especially in the early stages of the collaboration process. This avoids the misunderstandings that, as discussed during the entire workshop, are natural when bringing together researchers with different backgrounds. As it happens when one tries to learn a new language, the best way to engage in interdisciplinary research is to immerse oneself into the project, and dedicate to it as much time and energy as possible. This will also help greatly when a letter of collaboration is needed for a grant proposal or when a recommendation letter is needed for a promotion or tenure case.

Developing (Graduate) Students

- **Take time to properly train students:** When embarking on an interdisciplinary research endeavor, it is important to give the involved students time to train, to get acquainted with the terminology and the methodologies used in a field other than

their own, and to understand the basic literature of that field related to the topic under analysis.

- Develop and maintain a stable team of students with interdisciplinary interests in the topic: It is always helpful to have a group of students who are interested in one's work and to collaborate on it. But this is especially true of interdisciplinary work: bringing together, through more or less formal labs (depending on available funding), students from different disciplines who are interested in the topic being researched is helpful both for the student and for the faculty member leading them, who can count on the contribution of researchers outside of his/her main field.

Publishing and Communicating Results

- Seek out appropriate publication opportunities. We already mentioned the importance of aligned interests of the researchers involved in an interdisciplinary project. One specific point in which interests must be aligned is the strategy surrounding the publication of the research findings. In order to facilitate such alignment, the community should try to emphasize the importance of the establishment of interdisciplinary outlets which are universally recognized as high quality publications. Examples include [Technology Science](#) and the [Journal of Cyber Security](#).
- Break projects into sub-projects (to be published in different outlets) based on experience: An effective way of developing interdisciplinary research and, at the same time, helping the researchers involved align their publication needs could be to generate smaller projects from one larger research enterprise, dividing up the work according to the various collaborators' expertise. This could allow for the creation of various papers from the same general research idea, each one to be published in the various collaborators' established top field journals.
- Publish preliminary results: Especially for exploratory multidisciplinary work, such as many EAGER privacy and security projects, it is crucial to the advancement of science to share preliminary results. This would spur attention to the research topic and might possibly attract other interested researchers. It is important though to consider, again, potentially misaligned interests. In cases where researchers wish to publish in outlets that require their work to never appear elsewhere before, publication of preliminary results may be hindered.
- Include down time: Like in any challenging project, interdisciplinary researchers should take the time to enjoy their work, and appreciate what they achieved so far, individually and collectively with their collaborators.
- Have a translator: The way things are expressed and explained to readers, viewers, and listeners, especially those coming from different disciplines, is an important aspect of obtaining universal recognition. Having an advocate who can *translate* concepts from one field to another can be of great help. Understanding who in the privacy and cybersecurity community better aligns with interdisciplinary work can

be crucial in determining suitable terminology, and getting recognition of the quality of the work.

6 SUMMARY

This report identified issues in identifying measures of success in doing projects involving computer scientists and social scientists working together. These included the need for a common language and funding as an indicator of quality. The report also described challenges such as institutional barriers for interdisciplinary collaboration, publication barriers, and the difficulty of attracting and retaining students.

7 ACKNOWLEDGMENTS

Support for this research was provided through the National Science Foundation Division of Computer and Network Systems, Secure and Trustworthy Cyberspace Award 1551194. Jeremy Epstein had the original idea for this workshop. Katelyn Anders made the bulk of the logistical arrangements. Iman Kedir contributed to the editing of this paper.

Appendix A: Workshop Agenda

Due to severe weather in the Washington, DC area on the second planned day of the workshop, the event was reduced to one (extended) day to avoid long trip interruptions and travel delays and inconveniences for participants on their return home.

Agenda

- 8:45-9:00 [Coffee and tea available in Room 405]
- 9:00-9:10 Welcome; Logistics; Who's Who on the Project Team; A look back at a few previous workshops and their products (Lance Hoffman, Laura Brandimarte)
- 9:10-9:25 Introduction of NSF Program Directors and any other guests
SBE Perspective on cross-disciplinary research in cybersecurity (Heng Xu, Program Director, SBE)
CISE Perspective on cross-disciplinary research in cybersecurity (Nan Zhang, Program Director, CISE)
The importance of cross-disciplinary research in cybersecurity (Remarks by Jeremy Epstein, project instigator and former program director, NSF)
- 9:25-9:35 Quick meet and greet: name, affiliation, and state how you are feeling this morning (in 15 seconds)
- 9:35-10:45 Lightning presentations about experiences with interdisciplinary research - Part 1: 10 minutes per project
- 10:45-10:55 Break
- 10:55-12:00 Lightning presentations about experiences with interdisciplinary research - Part 2: 10 minutes per project
- 12:00-12:45 LUNCH
- 12:45-1:30 Plenary session: What worked and what didn't work in Interdisciplinary research projects
- 1:30-2:30 Breakout groups, part 1: Substantive barriers; institutional and recognition barriers; smaller hurdles
- 2:30-2:40 Break
- 2:40-2:45 GROUP PHOTO
- 2:45-3:45 Elected speakers from each breakout group report on the discussion.
Discussion of Breakout Group Findings; Summary of Key Findings
- 3:45-4:45 Breakout groups, part 2 on finding resolutions to these
Walk back to Washington Square Hotel
- 5:15-6:00 Elected speakers from each breakout group report on the discussion.
Discussion of Breakout Group Findings; Summary of Key Findings
- 6:00-6:30 Plenary session: What We've Learned. A Framework for Building Interdisciplinary Relationships Between Computer Scientists and Social Scientists in Your Institution
- 7:00-? (Optional) Organized Dinner meeting(s)

Appendix B. Participants

Alessandro Acquisti, Carnegie Mellon University, Information Systems and Public Policy



Alessandro Acquisti is a Professor of Information Technology and Public Policy at the Heinz College, Carnegie Mellon University (CMU), the director of the Peex (Privacy Economics Experiments) lab at CMU, and the co-director of Carnegie Mellon's CBDR (Center for Behavioral and Decision Research). He investigates the economics of privacy. His studies have spearheaded the investigation of privacy and disclosure behavior in online social networks, and the application of behavioral economics to the study of privacy and information security decision making. He has been the recipient of

the PET Award for Outstanding Research in Privacy Enhancing Technologies, the IBM Best Academic Privacy Faculty Award, the Heinz College School of Information's Teaching Excellence Award, and numerous Best Paper awards. His studies have been published in journals, books, and proceedings across a variety of fields, including Science, Proceedings of the National Academy of Science, Management Science, Journal of Economic Literature, Marketing Science, Journal of Consumer Research, ACM Transactions, Journal of Personality and Social Psychology, and Journal of Experimental Psychology. He has testified before the U.S. Senate and House committees on issues related to privacy policy and consumer behavior, and has been frequently invited to consult on privacy policy issues by various government bodies, including the White House's Office of Science and Technology Policy and the Council of Economic Advisers, the Federal Trade Commission, the National Telecommunications and Information Administration, and the European Commission. His findings have been featured in national and international media outlets, including the Economist, the New York Times, the Wall Street Journal, the Washington Post, the Financial Times, Wired.com, NPR, CNN, and 60 Minutes; his TED talks on privacy and human behavior have been viewed over a million times. His 2009 study on the predictability of Social Security numbers was featured in the "Year in Ideas" issue of the NYT Magazine (the SSNs assignment scheme was changed by the US Social Security Administration in 2011). He holds a Ph.D. from UC Berkeley, and Master degrees from UC Berkeley, the London School of Economics, and Trinity College Dublin. He has held visiting positions at the Universities of Rome, Paris, and Freiburg (visiting professor); Harvard University (visiting scholar); University of Chicago (visiting fellow); Microsoft Research (visiting researcher); and Google (visiting scientist). He has been a member of the National Academies' Committee on public response to alerts and warnings using social media and has recently joined the Board of Regents of the National Library of Medicine (NLM).

Bruce Berg, University of California, Irvine, Cognitive Sciences



Bruce G. Berg is an associate professor in the Department of Cognitive Sciences at the University of California, Irvine. In 1978, he received a Ph.D. from Indiana University in Psychology and was awarded a NIH Postdoctoral Fellowship from Harvard Medical School and Brigham and Women’s Hospital where he used signal detection theory to investigate the strategies of radiologists in reading images. His research interests are in theoretical psychoacoustics, signal detection theory, and auditory attention. Early in his career, he originated the technique of adding noise to a stimulus as a means for investigating attention, an experimental method that is now in wide use across several domains. Contributions to theoretical psychoacoustics include the idea that the peripheral filtering characteristics of the auditory periphery are different for spectral and temporal processes. Recent interest in cyber-security

concern the effects of environmentally induced sensory arousal and attentional distraction on the performance of security-critical tasks.

Adam Bossler, Georgia Southern University, Criminal Justice



Dr. Adam Bossler is an associate professor of Criminal Justice and Criminology. He earned his doctorate in criminology and criminal justice from the University of Missouri – St. Louis.

Bossler primarily teaches courses in policing, research methods, and criminal behavior. His current research focuses on examining the application of traditional criminological theories to cybercrime offending and victimization, how law enforcement responds to cybercrime, and exploring innovative correctional programs.

The two federal grants that he is currently working on examine innovative and/or effective programs, services and management strategies for special needs correctional populations; and smart policing in a rural county. His most recent publications can be found in *Crime & Delinquency*, *Youth & Society*, *American Journal of Criminal Justice*, *Policing*, and *Journal of Criminal Just*

Laura Brandimarte, University of Arizona, Management Information Systems



Laura Brandimarte is an Assistant Professor in the Management Information Systems Department at the Eller College of Management, University of Arizona. After completing undergraduate studies in Economics at La Sapienza University in Rome, Italy, she obtained her Master in Economics at the London School of Economics and Political Science, and her PhD in Public Policy and Management at the H. John Heinz III College, Carnegie Mellon University, where she also completed a two-year Post-doc. Her research focuses on the behavioral aspects of privacy, including how people make decisions on what to disclose and what not to disclose, what factors,

both normative and non-normative, affect privacy decision making, and what are the consequences of disclosing personal information, especially on social media. She has published on academic journals such as *Science* and *Social Psychological and Personality Science*, and her work was covered by several media outlets, including the *New York Times* and the *Pacific Standard Magazine*. Prior to joining academia, she worked at the European Investment Bank in Luxembourg and the Deposits Guarantee Fund for Cooperative Banks in Rome, Italy. Like most Italians, she is a huge fan of her family. Like many Italians, she is a proud, enthusiast supporter of AS Roma and Valentino Rossi.

Travis Breaux, Carnegie-Mellon University, Computer Science



Travis D. Breaux is an Associate Professor in the School of Computer Science at Carnegie Mellon University. Dr. Breaux's research program studies the intersection between human decision making and software design specification with applications to privacy and security. He is recipient of a NSF CAREER award, and served as Chair of the Security and Privacy Committee of the USACM Public Policy Council

Mike Burmester, Florida State University, Computer Science



Mike Burmester is a Professor of Computer Science at Florida State University (FSU) and the director of Center for Security and Assurance in IT (C-SAIT). He received his Ph.D. from the University of Rome (La Sapienza), Italy, and joined the faculty at FSU after more than 30 years of research and teaching at leading institutions around the world.

His research focuses on a wide range of security related topics including: cyber-physical system resilience, pervasive/ubiquitous network systems, RFID and sensor applications resilience, lightweight cryptographic applications, privacy/anonymity and trust management. Recent topics include, developing tools for analyzing human-computer interactions and online deception, in particular for trustworthiness attribution.

Dr. Burmester is editor of four Journals in Information Security, has organized several Workshops and Conferences, has two Books, five Book Chapters and over 120 journal and refereed conference publications covering a wide range of security topics.

Sriram Chellappan, Missouri University of Science & Technology, Computer Science



Sriram Chellappan is an Associate Professor in The Department of Computer Science and Engineering at University of South Florida, where he directs the SCoRe (Social Computing Research) Lab. His primary interests lie in many aspects of how Society and Technology interact with each other, particularly within the realms of Smart Health and Cyber Security. He is also interested in Mobile and Wireless Networking, Cyber-Physical Systems, Distributed and Cloud Computing. Sriram's research is supported by grants from National Science Foundation, Department of Education, Army Research Office, National Security Agency, DARPA and

Missouri Research Board. Prior to this appointment, he was an Associate Professor in the Computer Science Dept. at Missouri University of Science and Technology. Sriram received the PhD degree in Computer Science and Engineering from The Ohio-State University in 2007. Sriram received the NSF CAREER Award in 2013.

Jeremy Epstein, National Science Foundation



Jeremy Epstein is Senior Computer Scientist with SRI International in Arlington VA. From January 2012 to December 2015 he was lead program officer for the National Science Foundation's Secure and Trustworthy Cyberspace program, where he started the "new collaborations" program that led to this workshop. He is currently recovering from that 4-year stint, and will be joining another government agency in the very near future, where he'll continue to play a role in government funding of cybersecurity research.

Daniel Fabbri, Vanderbilt University,



Daniel Fabbri, PhD, leads the HAIL Lab in the Department of Biomedical Informatics at Vanderbilt University. The HAIL Lab was founded to address the challenges at the intersection of: (i) computer science, machine learning and data management, and (ii) healthcare. The Lab works to apply and develop computational methods to a wide range of healthcare issues from discharge prediction to cancer recovery times. Additionally, the Lab develops hospital IT infrastructure such as patient engagement systems and medical record search engines to improve health data management. Lab members work to publish papers in computer science and biomedical informatics proceedings, and deploy

tools in hospitals and the health community.

He also is the founder and CEO of Maize Analytics, a health IT company that provides machine learning tools for hospitals to protect patient data.

Corina Graif, Penn State University, Sociology & Criminology



Dr. Graif's published work focuses on the consequences of urban poverty and population diversity on crime and on the dynamics of personal and community social capital. It highlights the role that the severity of crime plays in influencing prosecutorial misconduct, and the relationship between neighborhood violence, immigration, and diversity in multi-ethnic and multi-racial urban US contexts. In her current research projects, Dr. Graif integrates sociological and criminological perspectives to investigate neighborhood effects and inequalities in spatial exposures and mobility and how they shape opportunities and affect crime, distress, and risky and delinquent behavior among urban children and youth.

Dr. Graif teaches graduate and undergraduate level courses on Communities and Crime. She co-organized a Conference on Mass Incarceration and Health, at the University of Michigan, Ann Arbor and served as a grant reviewer for the National Science Foundation. Dr. Graif chaired the 2013 American Society of Criminology Annual Meeting's Sessions on "Communities and Violence" and on "Prisons, Jails, and Mental Health". She is member of the American Society of Criminology's Program Committee, serving as Sub-Area Chair for the sessions on "Neighborhood Effects", part of the 2016 Annual Meeting in New Orleans, Louisiana. She co-organizes the PRI's Changing American Neighborhoods and Communities (CANAC) Working Group starting in the Fall of 2015.

For her 2015 article in *Criminology*, Dr. Graif received the Penn State's College of the Liberal Arts Roy Buck Award recognizing the best article accepted or published by a refereed scholarly journal in the social sciences within the last year.

Jeff Hancock, Stanford University, Communication



Jeff Hancock is a Professor in the Department of Communication at Stanford University. Professor Hancock and his group work on understanding psychological and interpersonal processes in social media. The team specializes in using computational linguistics and experiments to understand how the words we use can reveal psychological and social dynamics, such as deception and trust, emotional dynamics, intimacy and relationships, and social support. Recently

Professor Hancock has begun work on understanding the mental models people have about algorithms in social media, as well as working on the ethical issues associated with computational social science.

Professor Hancock is well-known for his research on how people use deception with technology, from sending texts and emails to detecting fake online reviews. His TED Talk on deception has been seen over 1 million times and he's been featured as a guest on "CBS This Morning" for his expertise on social media. His research has been published in over 80 journal articles and

conference proceedings and has been supported by funding from the U.S. National Science Foundation and the U.S. Department of Defense. His work on lying and technology has been frequently featured in the popular press, including the New York Times, CNN, NPR, CBS and the BBC.

Professor Hancock was a Customs Officer in Canada before earning his PhD in Psychology at Dalhousie University, Canada. He was a Professor of Information Science and Communication at Cornell prior to joining Stanford in 2015. He currently lives in Palo Alto with his wife and daughter, and he regularly does his best to stop pucks as a hockey goalie.'

Lance Hoffman, George Washington University, Computer Science



Dr. Lance J. Hoffman is known for his pioneering research on computer security and risk analysis, and for his interdisciplinary work in computer privacy issues. Distinguished Research Professor of Computer Science and Director of the Cyber Security Policy and Research Institute at The George Washington University (GW), he is the author or editor of five books and numerous articles on computer security and privacy.

A Fellow of the Association for Computing Machinery (ACM) and a senior member of the Institute of Electrical and Electronics Engineers (IEEE), Dr. Hoffman has served on a number of advisory committees dealing with privacy and security, including those of Federal Trade Commission and the Department of Homeland Security.

His research has spanned multiple aspects of cybersecurity, including risk analysis, privacy/data protection, and statistical inference for data mining. He directs GW's CyberCorps scholarship program that has produced almost 100 graduates, all the beneficiaries of cross-disciplinary instruction in the technology, policy, and management aspects of cybersecurity and privacy.

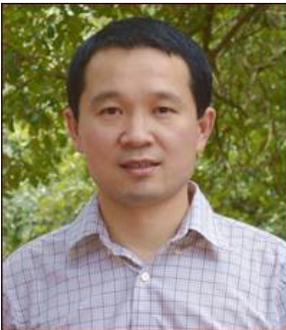
After a B. S. in Mathematics from Carnegie Mellon University, Dr. Hoffman earned his Ph. D. in Computer Science in 1970 from Stanford University, and went on to immediately teach the first regularly scheduled course on cybersecurity while on the faculty at University of California at Berkeley

Philip Howard, University of Washington, Communication



Philip N. Howard is a professor and writer. He holds faculty appointments at the [University of Washington](#) and [Oxford University](#). From 2013-15 he worked at [Central European University](#) in Budapest, where he was the Founding Professor of a new [School of Public Policy](#) and Director of the [Center for Media, Data and Society](#). He investigates the impact of digital media on political life around the world, and he is a frequent commentator on global media and political affairs. His projects on bots, digital activism, global information access, and political Islam have been supported by the [National Science Foundation](#), [US Institutes of Peace](#), and [Intel's People and Practices Group](#). He has published seven books and over 100 commentary essays, conference papers, book chapters, and academic articles. His research spans several disciplines, and he is among a small number of scholars who have won awards from all three major academic associations for his work in political science, sociology, and communication. He is the author, most recently, of *[Pax Technica: How the Internet of Things May Set Us Free or Lock Us Up](#)*. His BA is in political science from [Innis College](#) at the University of Toronto, his MSc is in economics from the [London School of Economics](#), and his PhD is in sociology from [Northwestern University](#). He has held senior academic posts at Stanford, Princeton, and Columbia Universities. His website is [philhoward.org](#), and he tweets from [@pnhoward](#).

Hongxin Hu, Clemson University, Computer Science



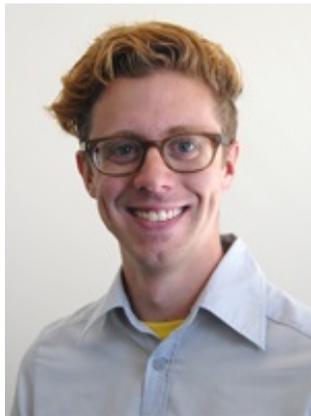
Dr. Hongxin Hu is an assistant professor in the School of Computing at Clemson University. He received my Ph.D. degree in computer science and engineering from Arizona State University in 2012. His research interests centrally focus on the area of Cyber Security. More specifically, he strives to develop effective solutions to address realistic security issues created by today's emerging technologies and applications, such as software-defined networking, social networks, mobile computing, cloud computing, healthcare systems, and big data. He has published over 70 refereed technical papers, many of which appeared in top conferences and journals. He is the recipient of the Best Paper Award from ACM CODASPY 2014. One of his papers was recently featured by the IEEE Special Technical Community on Social Networking. His research has also received wide press coverage including ACM TechNews, InformationWeek, NetworkWorld, Slashdot, and PCWorld.

Mark Jones, Portland State University, Computer Science



Mark Jones is a professor in the Department of Computer Science at Portland State University in Portland, Oregon. His primary research focus is on the use of advanced programming language technologies that support the construction and certification of secure and reliable software systems.

Patrick Gage Kelley, University of New Mexico, Computer Science



Patrick Gage Kelley is an Assistant Professor of Computer Science at the University of New Mexico. My research centers on privacy, visualization, media, and the influence of technology on culture and direct EXIT. I have worked on projects related to passwords, location-sharing, privacy policies, mobile apps, Twitter, Facebook relationship grouping, and the use of standardized, user-friendly privacy displays. My research is funded by the National Science Foundation and a Google Research Award. I received my PhD from Carnegie Mellon University working with the Mobile Commerce Lab and the CyLab Usable Privacy and Security (CUPS) Lab. I dabble in new media arts and information visualization, once with CMU's STUDIO for Creative Inquiry. Additionally, I teach

and speak on ethical issues in computing and am ACM SIGCHI's Adjunct Chair for Media+Brand.

Alfred Kobsa, University of California, Irvine, Information & Computer Science



Dr Alfred Kobsa is a Professor in the [Donald Bren School of Information and Computer Sciences](#) of the [University of California, Irvine](#). Before he was an Institute Director at the German National Research Center for Information Technology ([GMD-FIT](#), now part of Fraunhofer), and a Professor of [Computer Science](#) at the University of Essen, Germany. He was also an Associate Professor of Information Systems at the [Department of Information Science](#) at the University of Konstanz, Germany, and a Senior Researcher at

the [Department of Computer Science](#) of the University of Saarbrücken. He received his master degrees in Computer Science and in the Social and Economic Sciences from the [Johannes Kepler University Linz](#), Austria, and his Ph.D. in Computer Science from the [University of Vienna](#), Austria and the [Vienna University of Technology](#).

Dr Kobsa's research lies in the areas of user modeling and personalized systems, privacy, support for personal health maintenance, and in information visualization. He is the editor of [User Modeling and User-Adapted Interaction: The Journal of Personalization Research](#), and was the founding president of [User Modeling Inc](#). Dr. Kobsa edited several [books](#) and authored numerous [publications](#) in the areas of user-adaptive systems, privacy, human-computer interaction and knowledge representation. He also co-founded a national [workshop series](#) and an international [conference series](#) in these areas. He received research awards from the [Humboldt Foundation](#), Google, and several other organizations.

Erin Krupka, University of Michigan, Ann Arbor, School of Information



Erin Krupka is an experimental behavioral economist whose work contributes to the literature that models the sway of non-wealth factors on choice. Her work is relevant to the incentive-centered design of information systems pioneered at the School of Information. She is also an IZA affiliate.

Zenhui Li, Penn State University, Information Sciences & Technology



Zhenhui (Jessie) Li is an Assistant Professor in College of Information Sciences and Technology at Penn State University. Her research interest lies in data mining with a special focus on mining spatial-temporal data with applications in urban computing, social science, environment, and ecology. She has multiple publications in major conferences such as KDD, VLDB, and ICDM. She received her Ph.D degree in Computer Science from University of Illinois at Urbana-Champaign in 2012.

Joseph Mazer, Clemson University, Communication Studies



Dr. Joseph P. Mazer is an Associate Professor and Associate Chair of the Department of Communication Studies at Clemson University. He is also the Director of the Social Media Listening Center. His scholarly interests are in instructional communication, new communication technologies/social media, interpersonal/family communication, and quantitative research methods. Dr. Mazer's research has encompassed a range of topics including emotion in teaching and learning, teacher use of Facebook, teacher use of slang, student academic support, communication trait predictors of social media usage, and measurement and data analytic issues and trends in communication research.

Dr. Mazer is listed among the top 1% of prolific scholars in the discipline of Communication Studies spanning 2007-2011, according to a study published in the October 2012 issue of *Communication Education*, a national journal published by the National Communication Association. His research has been recognized through top paper and panel awards from the National Communication Association and Central States Communication Association, as well as the Lightsey Fellowship and Dean's Award for Excellence in Research from Clemson University's College of Architecture, Arts and Humanities. He joins William Seiler and Melissa Beall as a member of the authorship team for *Communication: Making Connections*, an introductory communication course textbook (in its 10th edition) published by Pearson.

Dr. Mazer's teaching interests are in new communication technologies/social media, communication theory, and quantitative research methods. He has received international, regional, university-wide, and departmental recognition for outstanding teaching. He is a past recipient of the Outstanding New Teacher Award from the Central States Communication Association and the Outstanding Professor of the Year Award from Clemson University's Department of Communication Studies undergraduate student body.

Dr. Mazer is an active member of the National Communication Association and Central States Communication Association where he has held several leadership roles. He is currently serving as Immediate Past Chair of the Instructional Development Division of NCA. Dr. Mazer serves on editorial boards for several journals in the communication discipline and recently completed a term as Associate Editor of the *Basic Communication Course Annual*. He serves as Consulting Editor for Forums for *Communication Education* and as an Associate Editor for *Journal of the Scholarship of Teaching and Learning*.

Dr. Mazer received his Ph.D. in Communication Studies from Ohio University, a master's degree in Communication from Illinois State University, and a bachelor's degree in Mass Communication from Mansfield University.

David McDonald, University of Washington, Information School



Dr. David W. McDonald is Professor and Chair of the Department of Human Centered Design & Engineering (HCDE) in the College of Engineering at University of Washington. Dr. McDonald's research focuses on the design and implementation of systems that support large-scale collaboration. He has published research on ubiquitous sensing for behavior change, collaboration in distributed contributor systems, collaborative authoring, recommendation systems, online communities for health & wellness, and public use of large screen displays. His research interests span Social Computing, Computer-Supported Cooperative Work (CSCW) and Human-Computer Interaction (HCI). Dr. McDonald earned his Ph.D. in Information and Computer Science at the

University of California, Irvine. At UC Irvine he was part of the Computing, Organizations, Policy and Society (CORPS) group. He worked at FX Palo Alto Laboratory in the Personal and Mobile technology group and at AT&T Labs in the Human Computer Interaction group. Dr. McDonald was a faculty in the UW iSchool from 2002 to 2014. Dr. McDonald served as a Program Officer for the Human Centered Computing (HCC), Network Science and Engineering (NetSE), and Social Computational Systems (SoCS) programs at the National Science Foundation (NSF).

Tyler Moore, University of Tulsa, Computer Science



Dr. Moore is the Tandy Assistant Professor of Cyber Security and Information

Assurance in the [Tandy School of Computer Science](#) at the [University of Tulsa](#). His research focuses on the economics of information security, the study of electronic crime, and the development of policy for strengthening security. He is also interested in digital currencies and critical infrastructure protection. He directs the [Security Economics Lab](#) at TU. He's also Director of [StopBadware](#), a non-profit anti-malware organization. Prior to joining TU, he was a postdoctoral fellow at the [Center for Research on Computation and Society \(CRCS\)](#) at [Harvard University](#), the Norma Wilentz Hess Visiting Assistant Professor of Computer Science at [Wellesley College](#), and an assistant professor at [Southern Methodist University](#). He completed [his PhD](#) at [the University of Cambridge](#) as a [Marshall Scholar](#), supervised by [Prof. Ross Anderson](#).

Together with [Prof. David Pym](#), he is Editor in Chief of the [Journal of Cybersecurity \(JCS\)](#). JCS is a new open-access publication from Oxford University Press, developed specifically to deliver a venue that bridges the many different disciplines and specialties involving information security.

From 2011-2014 he served as a Director and Vice President of the [International Financial Cryptography Association \(IFCA\)](#), which organizes the annual Financial Crypto

conference. He is also Vice Chair of the [IFIP 11.10 Working Group on Critical Infrastructure Protection](#).

Helen Nissenbaum, New York University, Media, Culture & Communication



[Helen Nissenbaum](#) is Professor of Media, Culture, and Communication, and [Computer Science](#), at New York University, where she is also Director of the [Information Law Institute](#). Her work spans social, ethical, and political dimensions of information technology and digital media. She has written and edited eight books, including [Obfuscation: A User's Guide for Privacy and Protest](#), with F. Brunton (MIT Press 2015), [Values at Play in Digital Games](#), with M. Flanagan (MIT Press, 2014), and [Privacy in Context: Technology, Policy, and the Integrity of Social Life](#) (Stanford, 2010), and her research publications have appeared in journals of philosophy, politics, law, media studies, information studies, and computer science.

Laurie Novak, Vanderbilt University



Dr. Novak is Assistant Professor in the Vanderbilt University Department of Biomedical Informatics. Her research examines the routinized, everyday practices of patients and health care workers. Domains of study have included: 1) everyday management of diabetes, pregnancy, cardiac disease, and asthma, 2) medication administration in the inpatient setting, including practitioners' understandings of risk and safety, 2) information security beliefs and practices in organizations, and 4) care coordination. The impact of new technology and other disruptions on routines has been a key focus of Dr. Novak's research. In the Vanderbilt University graduate program in biomedical informatics, she teaches qualitative methods, evaluation methods, and organizational studies.

Dr. Novak obtained her PhD in medical and organizational Anthropology at Wayne State University, and a Masters degree in Health Services Management and Policy from the University of Michigan School of Public Health. She is currently the chair of the People and Organizational Issues Working Group in the American Medical Informatics Association.

James O'Brien, University of California, Berkeley, Computer Science



James F. O'Brien is a Professor of Computer Science at the University of California, Berkeley and Chief Scientist at Avametric. His research interests include graphics, computer animation, simulations of physical systems, and the forensic analysis of images and video. He has authored numerous papers on these topics. In addition to his research pursuits, Prof. O'Brien has worked with film and game companies on integrating advanced simulation physics into games and special effects. His methods for destruction modeling have been used in over 90 feature films and AAA game titles. In 2015 the Academy of Motion Picture Arts and Sciences recognized his work in destruction modeling with an Academy Award for Technical Achievement. He received his doctorate from the Georgia Institute of Technology in 2000, the same year he joined the faculty at U.C. Berkeley. Professor O'Brien is a Sloan Fellow and ACM

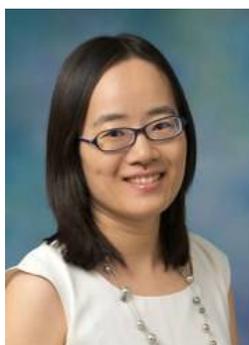
Distinguished Scientist, has been selected as one of Technology Review's TR-100, and has been awarded research grants from the Okawa and Hellman Foundations. He is currently serving as ACM SIGGRAPH Director at Large. <http://obrien.berkeley.edu>

Lynette Osborne, University of Texas at Austin, Sociology



Lynette Osborne is a sociologist who has been conducting evaluation studies on programs geared toward generating opportunities for under-represented populations in science, technology, engineering, and mathematics (STEM) since 2007. Her current projects include assessing the GW Scholarship for Service program and the ITEST program "Nanotechnology Experiences for Students and Teachers (NEST)" at IUPUI. Dr. Osborne also holds teaching appointments in the Sociology departments at both the The George Washington University and the University of Texas at Austin. She earned a Ph.D. from Purdue University in 2006, an M.A from Old Dominion University in 1996, and a B.A. from CSU, Chico in 1993.

Cuihua Shen, University of California, Davis, Communication



Cuihua's research and teaching interests revolve around the structure and impact of social networks in virtual worlds. Her recent work has focused primarily on the patterns, effects and dynamic evolution of participants' social networks in Massively Multiplayer Online Games (EverQuest II, EVE Online, Chevaliers' Romance, and Travian) as well as other online communities designed for collaborative peer production, social support and entertainment. In her research she tries to match "big data" from online
ss-Disciplinary Collaboration in Cybersecurity: A Workshop Report

behavioral logs with "smaller data" collected from surveys and experiments. Her work has appeared in top-ranked journals including *Communication Research*, *Journal of Computer-Mediated Communication*, *New Media & Society*, *Journal of the American Society for Information Science and Technology*, *Computers in Human Behavior*, and *Cyberpsychology, Behavior and Social Networking*. Cuihua is also an affiliated researcher at Ninja Metrics.

Myra Washington, University of New Mexico, Communication & Journalism



Myra Washington is an Assistant Professor at the University of New Mexico. Her research converges at the intersection of race, media, cultural studies and digital media studies. She is interested in how media shapes the ways we understand myriad identity categories like gender, class, sexuality, race, et al. She writes about things as varied as Twitter activism to the Black Lives movement to postfeminism to representations in tv and film

Kefeng Xu, University of Texas, San Antonio



Kefeng Xu is an associate professor in the Department of Management Science and Statistics in the College of Business, University of Texas at San Antonio (UTSA). He joined UTSA after completing his Ph.D. in business administration with double majors in operations management and logistics / transportation from the University of Maryland. He also holds an M.S. in business administration from the University of British Columbia (Canada) and a bachelor of engineering from Shanghai Jiao-Tong University (China).

Dr. Xu's areas of expertise and research interests include information sharing, incentive, and coordination issues in supply chain, and logistics, service and manufacturing strategy, among others. His works have appeared in a number of highly-impactful journals such as *Production and Operations Management*, *Marketing Science*, *Decision Sciences Journal*, *Journal of Management Information Systems*, *Transportation Research*, *Journal of Business Logistics*, *European Journal of Operational Research*, *Journal of International Business Studies* and *International Journal of Production Economics*, earning him significant peer citations according to Google Scholars.

His research has also received awards such as the Best Analytical Research Paper Award in the Decision Sciences Institute Annual Conference, E.G. Plowman (Best Paper) Award in the Council of Logistics Management Educators conference, the First Prize Graduate Research Award in the Transportation Research Forum, and the Col. Jean Migliorino and Lt. Col. Philip Piccione Endowed Research Award in the College of Business (2003 and 2016). He serves on the editorial boards of *Journal of Operations Management*, *Transportation Journal*, *Journal of Business Logistics* and *Journal of Supply Chain and Operations Management*. Recently he also received a prestigious

National Science Foundation research award to study the Supply Chain Security and Quality Control in Business and Social Context.

Chuan Yue, Colorado School of Mines, Computer Science



Chuan Yue is an Assistant Professor of Computer Science at the [Colorado School of Mines \(CSM\)](#). His current research focuses on (1) Web, Mobile, and Cloud systems security, (2) usable security and privacy, (3) vulnerability measurement and analysis, and (4) cybersecurity education. His broad research interests include Security and Privacy, Web-based Systems, Human-Computer Interaction, Collaborative Computing, Distributed and Parallel Computing, Cloud Computing, and Mobile Computing. His research and educational activities are currently supported by the National Science Foundation (a big Thanks!). He received his B.E. and M.E. degrees in Computer Science from the [Xidian University](#), China, in 1996 and 1999, respectively, and his Ph.D. in Computer Science from the [College of William and Mary](#) in 2010. He [worked](#) as a Member of Technical Staff at Bell Labs China, Lucent Technologies for four years from 1999 to 2003, mainly on the design and development of the Web-based Distributed Service Management System for Intelligent Network. He worked as an Assistant Professor of Computer Science at the [University of Colorado Colorado Springs \(UCCS\)](#) for five years (and commuted between Denver and Colorado Springs for four years) before joining CSM.

Yao Zhao, Rutgers University, Supply Chain Management & Marketing Science



Dr. Zhao is a professor in the department of Supply Chain Management at Rutgers Business School. He holds a Ph.D. degree in Industrial Engineering and Management Sciences in 2002 from Northwestern University, Evanston, IL. His research interests lie in supply chain management, project management, and healthcare services management. He published on leading operations research and management journals such as *Operations Research*, *Manufacturing & Service Operations Management (M&SOM)*, *Production and Operations Management*, and serves as an associate editor for *Operations Research*. He is the recipient of honorable mention in M&SOM student paper competition in 2001, the National Science Foundation Career Award on Manufacturing Enterprise Systems in 2008, the Dean's Award for Meritorious Research in 2011, and the 1st prize of INFORM case writing competition in 2014.

Yao was invited to speak about his research at seminar series of leading universities and industry research laboratories, such as Columbia University, MIT, IBM Watson Research, Chicago Booth, Northwestern University, Michigan Ross and University of Maryland. His research was reported by news media such as *Aviation Week & Space Technology* and *International Innovation*. His PhD students hold tenure-track faculty positions in prestigious research universities such as the College of William and Mary, Alfred Lerner College of Business and

Economies at the University of Delaware, the Kania School of Management at the University of Scranton, and School of Management at NJIT. Yao teaches core operations and supply chain management courses for undergraduate, MBA, Executive MBA and PhD programs at Rutgers Business School. He is prolific case writer and has extensive consulting experiences with companies and governmental agencies, such as General Motors, Estee Lauder, Verizon, MTA, Special Olympics, and Defense Logistics.