KOGOD CYBERSECURITY GOVERNANCE CENTER

Year of Change

2018 Annual Report

"Produce knowledge and technology that will enable individuals, commercial entities, and the government to benefit from technological advancements and data use while proactively identifying and mitigating cyber risks."

—National Privacy Research Strategy
July 1, 2016

Strategic Vision

In 2018, the Kogod Cybersecurity Governance Center welcomed new leadership, enjoyed significant intellectual growth, and expanded in all focus areas. Our growing reputation for world-class research on cybersecurity and privacy gave us the opportunity to achieve positive and lasting practical impacts by informing today's business leaders with actionable and well-supported guidance on related issues.

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RESEARCH

Research is the very foundation of the Kogod Cybersecurity Governance Center. Facilitating high-quality, world-leading research on cybersecurity and privacy at Kogod is our number one mission.

As past efforts on cybersecurity research are heavily skewed towards system security issues, we are unique among academic initiatives in our foci on two aspects of cybersecurity research: human factors and data analytics.

Our research on human factors aims to understand how the complex interplays between automated systems and human users—especially behavior patterns and economic drivers—affect cybersecurity and privacy.

Our research on data analytics aims to study the emerging threats to cybersecurity and privacy posed by big data techniques, as well as to examine the cybersecurity and privacy challenges threatening the utility and robustness of data analytics.

BUSINESS FOCUSED.
DATA DRIVEN.
HUMAN CENTRIC.
RISK AWARE.

CROSS-CUTTING THEMES

Cybersecurity and privacy research at the center is shaped by four pillars:

- **Human factors**
  How to address the complexity of human behavior in the design of cybersecurity solutions

- **Data analytics**
  How to leverage data analytics techniques without making them a new cyber attack vector

- **Social equity**
  How to better study the social implications of cybersecurity and privacy technologies, such as discrimination, disparity, fairness, etc.

- **Business dynamics**
  How automated systems and data analytics are reshaping how businesses create value in privacy and cybersecurity

PRACTICE

The Kogod Cybersecurity Governance Center also strives to bridge research and practice, specifically by informing today's business leaders with actionable guidance on cybersecurity.

Our objective is to strongly interface with practice so that, on one hand, the visibility and reputation of the center in the research community can be expanded to the business world while, on the other hand, researchers in Kogod and other parts of American University can leverage the expanded visibility and reputation of the center to collaborate with businesses on research, e.g., by identifying emerging challenges and defining new research problems from real businesses, by acquiring real-world data from business collaborators, etc.

A New Beginning

In 2018, the center welcomed a new director and a top data scientist...

NEW DIRECTOR

Dr. Heng Xu

July 2018

Dr. Heng Xu joined Kogod as the director of the Kogod Cybersecurity Governance Center and a professor of information technology (IT) and analytics. Before joining Kogod, she had a mix of academic and government experience, serving as a program director at the National Science Foundation (NSF) for three years and a faculty member at Penn State for 12 years. She also served on a broad spectrum of national leadership committees, including co-chairing the Federal Interagency Working Group on privacy (2016) and developing the National Privacy Research Strategy (2014-2016).

NEW FACULTY MEMBER

Dr. Nan Zhang

July 2018

Also joining the center is Dr. Nan Zhang, a professor of IT and analytics at Kogod. Before joining Kogod, he was a professor of information sciences and technology at Penn State, a professor of computer science at George Washington University, and a program director at NSF. According to csrankings.org, Dr. Zhang is ranked among the top 15 computer scientists in the US in premier database publications from 2009 to 2019.

...and launched several federally funded research projects.

Situation-Aware Identification and Rectification of Regrettable Privacy Decisions

Funded by the National Science Foundation, 2018-2022

Despite numerous efforts to develop tools to help individuals make better privacy decisions, users still make mistakes and regret their privacy decisions later. This $900K project sponsored by NSF and directed by Heng Xu and Nan Zhang casts a fresh perspective on privacy-by-redesign by helping users revisit and rectify past privacy decisions that they may regret.

Establishing and Boosting Confidence Levels for Empirical Research Using Twitter

Funded by the National Science Foundation, 2018-2021

Concerns about a reproducibility crisis in scientific research have become increasingly prevalent within academia and the public at large. This $400K project sponsored by NSF and directed by Heng Xu and Nan Zhang examines the inconsistent handling of organic data among scholarly publications in social and behavioral sciences in order to assess the confidence (or the lack thereof) in the conclusions drawn from data analysis.

The Generalizability and Replicability of Twitter Data for Population Research

Funded by the National Science Foundation, 2018-2021

This $500K project funded by NSF aims to evaluate the extent to which Twitter users represent the population across different demographic groups. Heng Xu is a co-investigator in collaboration with a group of social scientists at Penn State.

Learn more at
kogod.american.edu/research/cybergov

Research Highlights

A core mission of the center is to conduct world-class research on cybersecurity and privacy.

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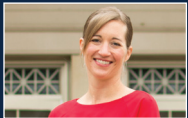
Casey Evans
Accounting

Sharing Insider Threat Indicators: Leveraging SWIFT's Messaging Platform to Combat Cyber Fraud

Objective: to identify the patterns of behavior typically indicative of efforts by criminals to use insiders to cash out on fraudulent activities, so organizations across industries can share threat information through enhanced communication channels to preempt cyber fraud schemes.

Heng Xu
IT & Analytics

Nan Zhang
IT & Analytics

Privacy Disparity in Public Health Data

Objective: to investigate whether privacy disparity exists over raw, unprocessed, public health data and to examine the effect of state-of-the-practice and data anonymization techniques on both privacy disparity and the efficacy of health disparity research.

Augustine Duru
Accounting

Parthiban David
Management

Resilience to Adverse Financial Consequences of Cyberattack

Objective: to develop a predictive model to identify and quantify the organizational factors that build resilience to mitigate the adverse financial effects of cyber breaches.

Ayman Omar
Int'l Business

Understanding and Managing Cyber Risks in Global Supply Chains

Objective: to better understand cyber risks in global supply chains by examining the sources of such risks and by quantifying those risks in terms of likelihood of occurrence and potential impact.

Donald T. Williamson
Accounting

Ransomware: Tax Compliance Issues for a New Reality

Objective: to develop a predictive model for identifying and quantifying the organizational factors that build resilience to mitigate the adverse financial effects of cyber breaches.

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View more at
kogod.american.edu/research/cybergov

Research Pillars

CYBERSECURITY + HUMAN FACTORS

How to address the complexity and nuances of human behavior in the design of cybersecurity solutions?

CYBERSECURITY + DATA ANALYTICS

How to leverage data analytics techniques without making them a new attack vector?
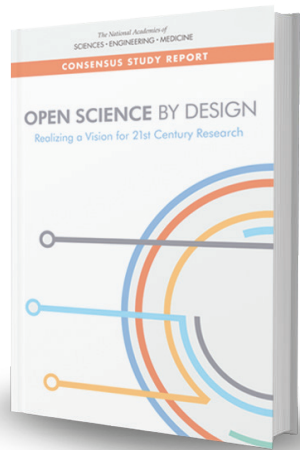
CYBERSECURITY + SOCIAL EQUITY

Detecting disparities requires access to data about the minority population. Is privacy disparity a new threat?

PRIVACY + BUSINESS DYNAMICS

Who is the next Cambridge Analytica? Why is the public outraged by some data misuse but indifferent to others?

ON SHELVES

July 2018

Open Science by Design: Realizing a Vision for 21st Century Research

The National Academies of Sciences, Engineering, and Medicine released a new report entitled *Open Science By Design: Realizing a Vision for 21st Century Research* which introduces a framework of "open science by design" that aims to foster openness—on publications, data, methodologies, algorithms, and code—from beginning to end in the research process. This report was produced by the National Academies Committee on Toward an Open Science Enterprise, of which Heng Xu is a member.

IEEE SYMPOSIUM ON PRIVACY-AWARE COMPUTING

September 2018

Kogod Cybersecurity Governance Center member Professor Nan Zhang co-chaired the technical program for this year's IEEE Symposium on Privacy-Aware Computing, which was sponsored by the Technical Committee on Security and Privacy (TCSP) of the IEEE. The symposium brought together experts from academia, government, and industry to present and discuss recent advances and new perspectives on related research and development in privacy-aware computing.

Jeremy Epstein, deputy division director at NSF, gave the keynote at the symposium.

IN THE PRESS

July 2018

2018 SANS Security Awareness Report

Continuing collaborations with the SANS Institute, the Kogod Cybersecurity Governance Center provided all data analysis support for this annual, data-driven report on the state of the security awareness program in the US and beyond.

CYBERSECURITY & PRIVACY FORUM

September 2018

The Kogod Cybersecurity Governance Center organized a cybersecurity and privacy forum on campus in September 2018 with the theme of bridging research and practice. The forum started with a keynote featuring cybersecurity expert Joe Valacich, who is both the Eller Professor in the Eller College of Management at the University of Arizona and a co-founder of successful cybersecurity startup Neuro-ID, Inc. After the keynote, technology, business and legal experts presented a panel discussion on bridging research and practice.

From left: Joe Valacich, University of Arizona; Patrick Carrick, chief scientist, Department of Homeland Security; Casey Evans, Kogod; Jules Polonetsky, CEO, Future of Privacy Forum; and Anthony Vance, Fox School of Business, Temple University.

ALL-AMERICAN WEEKEND

October 2018

Kogod Cybersecurity Governance Center director, Professor Heng Xu, delivered one of the four AU Ed Talks in this year's All-American Weekend. Her talk, "Data in the Everyday," visited the common myths and misconceptions about analytics in the Big Data era, telling real-world stories about the pitfalls in designing, performing, and interpreting data analytics in business practices.
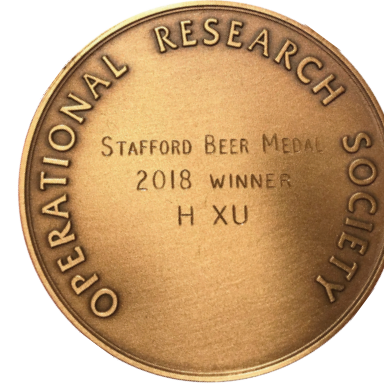

STAFFORD BEER MEDAL

November 2018

Heng Xu, Kogod Cybersecurity Governance Center director, was awarded the 2018 Operational Research (OR) Society's Stafford Beer Medal for her paper "Examining the Intended and Unintended Consequences of Organisational Privacy Safeguards." The OR Society is "the world's oldest-established learned society catering to the operational research profession." The Stafford Beer Medal was established in memory of Stafford Beer, a British theorist and professor who was a world leader in operational research.

Educational Initiatives

Workshop
ROBUST ANALYTICS

Planned for spring 2019, this workshop discusses the robustness of analytics for security and other applications.

New Course
CYBER ANALYTICS

This course discusses the role of analytics in strengthening the defense of critical cyber assets.

New Course
DATA ETHICS

This course discusses ethics in the context of AI, data analytics, and machine learning.

DISTINGUISHED LECTURE SERIES

Scheduled throughout 2019, speakers come from tech companies, government, academia, and more.

ICIS DOCTORAL CONSORTIUM

December 2018

The Kogod Cybersecurity Governance Center was a major force in the 2018 annual doctoral consortium for the information systems (IS) research community. Two members of the center served as faculty mentors, and center director, Heng Xu, co-chaired the consortium. For doctoral students in IS, selection into the consortium is highly competitive and considered a prestigious honor.

All students and faculty mentors attending the 2018 doctoral consortium at the International Conference on Information Systems (ICIS).

In July 2018, I came to Kogod and AU from Penn State, where I was a professor of information sciences and technology for 12 years. Even though I'm new to Kogod, I'm not new to the DC area. Between 2013 and 2016, I served as a program director at the National Science Foundation, helping manage the largest cybersecurity research program in the nation, the Secure and Trustworthy Cyberspace (SaTC) program. Also during this period, I co-chaired the interagency working group on privacy and helped draft the National Privacy Research Strategy that you saw at the beginning of the report.

My passion for cybersecurity and privacy research—and my love for the city—brought me to Kogod and the Kogod Cybersecurity Governance Center. What impressed me the most after my arrival is how our team at the center—both faculty and students—strive to make a positive and lasting impact in practice. I saw an excellent example when the SANS Institute contacted me to thank our center for contributing to the 2018 Security Awareness Report. I was also proud to see the accomplishment of our faculty members, like Professor Casey Evans who, together with her collaborator, received two grants from SWIFT on combating cyber fraud in 2016-2017. I am happy to share that in 2018, our team at the Kogod Cybersecurity Governance Center received three new research grants from the National Science Foundation totaling $1.8 million. But most importantly, I am excited that we formed a new strategic vision for the center, which was enthusiastically supported by our advisory committee members.

Looking ahead, we have many wonderful activities planned for 2019. In particular, we have lined up a distinguished list of speakers from leading technology companies, federal agencies, and the academic research community for the inaugural Kogod Cybersecurity Governance Center Cybersecurity Lecture Series. I look forward to seeing you at these upcoming events!

Heng Xu
Director, Kogod Cybersecurity Governance Center
Professor, Kogod School of Business

Thank You

In order to pursue world-class research on cybersecurity and privacy, the Kogod Cybersecurity Governance Center relies on the support from Kogod leadership and our sponsors. We are very grateful for their extremely generous support, which enabled the many initiatives described in the report.

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