COLUMBIA | SIPA
School of International and Public Affairs

Initiative on the Future of Cyber Risk

A project of the Columbia University School of International and Public Affairs (SIPA)
Technology and Policy Initiative

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Throughout the 2015-2016 academic year, Columbia University's School of International and Public Affairs sought to provide a better understanding of critical and emerging issues within the realm of cyber, in response to a world that is rapidly adopting digital technologies and incorporating them into additional areas of our society, economy, infrastructure, government, and military. This new reliance created new opportunities as well as new risks.

SIPA's interdisciplinary, inter-school program aimed to tackle a number of crucial issues, including:

➢ What are the future cyber risks?
➢ How might the future Internet look far different – perhaps significantly better or far worse – than today?
➢ What is a nation's true cyber power and how might that change over time?
➢ What are the dynamics of cyber conflict and how does it differ at the tactical and strategic levels?
➢ How can public policy mitigate these risks and lead to better digital futures?
➢ How do business and systemic cyber risks apply to the financial sector?

The initiative sought to engage several key work streams within the diverse Columbia University community, including world-class faculty, scholars, and students. By focusing its resources towards this engagement, as well as thought leadership, publication, global influence via speaking events and interviews, and sustained program growth, the initiative sought insight for several key goals:

1. To better understand the unfolding dynamics of digital power and digital risks – from systemic shocks, escalating cyber conflict and espionage, and other threats – through novel research, incisive and inclusive conversations, outreach and involvement with the cybersecurity and national security communities.
2. To establish Columbia University and SIPA as one of the top centers in the world for leading thinking on cyber power and cyber risk. Global leaders will seek to be involved in our work and our graduates will be sought out by employers.
3. Creating and mentoring the next generation of leaders, which in turn will further draw in global leaders and funding support.

Major Achievements

1. State of the Field Conference for Cyber Conflict [June 16-17, 2016]

Hosted jointly by Columbia University (SIPA) and the Cyber Conflict Studies Association (CCSA), this major conference attracted more than 40+ attendees, with a diversity of academics and practitioners. Academic institutions represented included the U.S. Military Academy, Kings College, Carnegie Mellon University, University of Glasgow, U.S. Air Force Academy, Stanford University, New York University, Air Force Cyber College, National Defense University, John Hopkins University, while professional institutions in attendance included the Council on Foreign Relations, PwC, U.S. Cyber Command, Crowell & Moring, Defense Group Inc., Carnegie Endowment for International Peace, and Red Branch Consulting. The conference was organized into six breakout sessions, focusing on International Relations, Tactical & Operational Level Dynamics, Intelligence & Adversaries, Strategic Dynamics, Cyber Conflict History, and Legal Issues, each of which were followed by a conference-wide plenary discussion session. Intended deliverables in-progress include annotated conference notes, a conference report, and a book on the field's canonical works.

2. Columbia SIPA Digital and Cyber Group

This student-run initiative, formed in the fall of 2016, aims to raise the knowledge and awareness of Digital and Cyber issues amongst the SIPA student body by providing a central platform for resources, a curated series and events, and connections to the wider Columbia community. The group has also worked to make SIPA the leader in digital and cyber policy by integrating those subjects into the general curriculum, and highlighting the intersection between digital and cyber issues and other global salient subjects.

Columbia SIPA Digital and Cyber Group – May 2016

3. New York Cyber Task Force (NYCTF)

The NYCTF is a major initiative aimed at exploring methods to make cyberspace more defensible. The task force consists of representatives from academia and thin thanks, as well as former policy makers and cybersecurity executives from finance and media, resulting in a balanced, New York perspective on cyberspace. The group's unique location differs from other Washington DC-centered task forces, which have clearly defined government biases. The NYCTF includes attendees from a variety of industries, including: Crowdstrike, American Express, Palantir, McKinsey, Council on Foreign Relations, Barclays, JP Morgan Chase, Microsoft, World Economic Forum, Blackrock, Morgan Stanley, Goldman Sachs, NASDAQ, and Citi.

4. Graduate Student Research on 0day Vulnerabilities

Five student research teams spent the spring 2016 semester conducting original research on 0day vulnerabilities, focusing their efforts on 0day markets, governmental processes for disclosure, corporate programs, and quantitative measurement. Research included interviews with top experts within the public and private communities. The teams presented their findings, which will be compiled into a final report for publication in fall 2016.

Events and Panels

In-House SIPA Events

1. Panel discussion on income inequality panel, tech and innovation on July 13, 2015 at SIPA.
2. Panel discussion serving as introduction to cyber for students on January 27, 2016, organized by SIPA's Digital and Cyber Group.
3. Panel discussion via digital conference with Glenn Denning, Director of Columbia's Center on Globalization and Sustainable Development, on April 13, 2016.
4. Panel discussion with Randy Milch, Fellow at New York University Law School Center on Law and Security, regarding the Apple-FBI debate on April 13, 2016.
5. SIPA panel discussion regarding the Paris attack and the future of IS on April 13, 2016.
6. Moderator for symposium discussion on the SIPA paper series on March 23, 2016.
7. Panelist for multidisciplinary workshop on June 24, 2015.
8. Brown bag for SIPA students with Brandon Valeriano on October 1, 2015 to discuss *Cyber War and Cyber Realities*.
9. Moderator for cyber conference at SIPA on May 15, 2015.
10. Four meetings of the New York Cyber Task Force (NYCTF)
11. Symposium on cyber proxies, co-hosted with Carnegie Endowment for International Peace, on July 25, 2016

Notable Speakers, Guests, and Panelists at SIPA

1. Sean McAfee, Department of Homeland Security
2. Rob Sheldon, Center for Strategic and International Studies (CSIS), Business Executives for National Security (BENS)
3. Alejandro Mayorkas, Deputy Secretary of U.S. Department of Homeland Security
4. John Hultquist, iSight Partners
5. Peter Roady, Harvard Belfer Center for Science and International Affairs
6. Kimberly Zenz, iDefense
7. Catherine Mulligan, Zurich Insurance
8. Admiral Michael S. Rogers, Commander of the U.S. Cyber Command and Director of the National Security Agency (NSA)
9. Fadi Chehadé, CEO of iCANN
10. Steve Hadley, Board Director of Atlantic Council, Former U.S. National Security Advisor
11. Toomas Hendrik Ilves, President of the Republic of Estonia

Deputy Secretary Alejandro Mayorkas
'Managing Our Nation's Cyber Risk', Oct. 2015

Admiral Michael S. Rogers
'The Future of America's Cyber Power', Nov. 2015

External Events – Presenter / Speaker

1. Panelist in discussion on Cyber Risk Wednesday on May 20, 2015, hosted by the Atlantic Council.
2. Panelist in discussion on CIOs, CFOs, and COOs and legal components in June 3, 2015, hosted by Thomson Reuters.
3. Panelist in discussion on national security for insurance brokers on July 15, 2015, hosted by Zurich Insurance.
4. Panelist in discussion debate on US-China perspectives of cyber on July 20, 2015, hosted by Nanyang Tech University, Singapore.
5. Panelist in discussion of Cyber Risk Wednesday and the response to the OPM Hack on August 19, 2015, hosted by the Atlantic Council.
6. Participant in panel discussion regarding the launch of the Zurich report on 'Overcome by Cyber Risks' on October 15, 2015, hosted by the Atlantic Council.
7. Participant in panel discussion regarding 'cyber' in 2016 and Cyber Risk Wednesday on December 9, 2015, hosted by the Atlantic Council.
8. Panelist in discussion on international cyber developments, alongside Dmitri Lashway on December 15, 2015, hosted by American Lawyer and Baker McKenzie.
9. Panelist in discussion with Gordon Goldstein on innovation and security on January 7, 2016, hosted by the Council on Foreign Relations.
10. Panelist in discussion on the New York Cyber Task Force and data, on April 6, 2016, hosted by the Data Sciences Institute.
11. Panelist in discussion with Michele Malvesti on April 11, 2016, hosted by the Fletcher School at Tufts.
12. Panelist in discussion for educator's event with Adam Segal and Catherine Lotrionte on April 15, 2016, hosted by the Council on Foreign Relations.
13. Speaker at the conference for S4x16 ICS Cybersecurity on Zurich on January 14, 2016, hosted by Digital Bond.
14. Keynote speaker at the conference for ICRMC Insurance and Risk Management on June 15, 2015, hosted by Zurich Insurance.
15. Presenter at the presentation 'Discussion of Overcome by Cyber Risks' on September 21, 2015, hosted by Symantec and Global Government Affairs.
16. Presented talk titled 'Economic Costs and Benefits' on November 5, 2015, hosted by RSA Abu Dhabi.
17. Moderated the workshop titled 'Cyber Risk & Modeling Discussion' on June 8, 2015, hosted by Oxford University.
18. Speaker at the workshop titled 'Cyber Risk & Modeling Discussion' on June 15, 2015, hosted by Atlantic Council.
19. Moderator for the workshop titled 'Discussion with State, BIS on Waasenaar' on October 21, 2015, hosted by Atlantic Council.
20. Moderator for the workshop titled 'MSC discussion in Abu Dhabi' on November 4, 2015, hosted by the Munich Security Conference.
21. Presenter at the workshop 'Creating a National Digital Strategy' on December 2, 2015, hosted by the World Economic Forum.
22. Speaker at the workshop discussing the New York Cyber Task Force on April 4, 2016, hosted by McKinsey.
23. Panelist on discussion with David Sanger, and Andy Ozment on March 10, 2016, hosted by the Aspen Institute.
24. Panelist in audio discussion regarding the US-China Cyber Deal on October 6, 2015, hosted by the Atlantic Council.
25. Panelist for breakfast discussion of Overcome by Cyber Risks with Bob Abernathy on October 2, 2015, hosted by the Atlantic Council.
26. Speaker at the conference 'Saving Cyberspace' on November 10, 2015, hosted by FedCyber.

27. Moderator for the Cyber Wargame with General Jones on November 4, 2015, hosted by RSA Abu Dhabi.
28. Presenter at Aspen Security Conference on July 28, 2016.
29. Presenter at BlackHat Conference in Las Vegas on August 4, 2016
30. Presenter at DEF CON Conference in Las Vegas on August 5, 2016.
31. Panelist at Atlantic Council event: "A Public Policy Lens on the Hacker Conferences" in Washington D.C. on August 10, 2016.

Jason Healey presenting at DEFCON Conference
'Feds and 0Days: From Before Heartbleed to After FBI-Apple', August

External Events – Participant

1. Participant in IANA Workshop with Fadi Chehade and Steve Hadley on June 2, 2015, hosted by the Atlantic Council.
2. Participant in private lunch with Swedish Minister of Defense on May 21, 2015, hosted at the residence of the Swedish Ambassador.
3. Participant in discussion with Asia-PAC Cyber Officials on October 5, 2015, hosted by the State Department IVLP.
4. Participant in webcast with PwC on Information Sharing on July9, 2015, hosted by PwC.
5. Testimony before House Subcommittee on Financial Institutions on May 19, 2015.
6. Discussion with FBI over 'going dark' on October 16, 2015, hosted by Columbia Law School.
7. Participant in Abu Dhabi Strategic Debate conference on November 2, 2015, hosted by the Emirates Policy Center.
8. Panelist for discussion on board and C-suite cyber risks on September 24, 2015, hosted by Business Executives for National Security (BENS).
9. Organizer for the RSA Wargame on March 2, 2016, hosted by RSA USA.
10. Participant in US-EU Cyber Dialog Readout with Chris Painter on December 8, 2015, hosted by the State Department.
11. Participant in follow-up State Department cyber policy discussion with Chris Painter on December 9, 2015, hosted by the State Department.
12. Participant in meeting of Active Defense Task Force with Michael Chertoff and Dennis Blair on December 7, 2015, at George Washington University.
13. Participant in meeting of Active Defense Task Force for Hewlett Foundation on February 29, 2016, hosted by George Washington University.
14. Participant in breakfast with Army Chief of Staff on September 30, 2015, hosted by the Army Cyber Institute.
15. Participant at meeting of the DSB Task Force on Cyber Deterrence on May 27, 2015, hosted and organized by the Defense Science Board.
16. Participant at meeting of the DSB Task Force on Cyber Deterrence on June 30, 2015, hosted and organized by the Defense Science Board.
17. Participant at meeting of the DSB Task Force on Cyber Deterrence on August 4, 2015, hosted and organized by the Defense Science Board.
18. Participant at meeting of the DSB Task Force on Cyber Deterrence on September 3, 2015, hosted and organized by the Defense Science Board.
19. Participant at meeting of the DSB Task Force on Cyber Deterrence on February 16, 2016, hosted and organized by the Defense Science Board.

Publications and Media

Select Interviews, Broadcasts and Media Coverage

1. OPM Hack (CNN News)
2. Paris attack and encryption (FOX Business News)
3. Why NATO recognizes cyberspace as a domain of warfare (CBS News)
4. U.S. Cyber arsenal is smaller than imagined – on purpose (The Hill)
5. The NSA zero-day stockpile may contain only 'dozens' of vulnerabilities, researched claims (International Business Times)
6. Government retains dozens, not thousands, of zero days (SC Magazine)
7. A foreign power could hack the US election, experts fear (VICE News)
8. U.S. military has launched a new digital war against the Islamic State (Washington Post)
9. Russia's fingerprints seen on DNC hack (The Hill)

Jason Healey interviewed on 'CBS This Morning' discussing cyberspace as an operational domain

Major Publications

1. Overcome by Cyber Risks (Atlantic Council) – Major report
2. Will 2015 be the year we shoot back in cyberspace? (CSM Passcode)
3. Estonia's Democracy Goes Digital (The National Interest)
4. Breaking the Cyber Sharing Logjam (Atlantic Council)
5. The Healthcare Internet of Things: Risks and Rewards (Atlantic Council)
6. Cyber Command as a 5-Year-Old (Defense News)
7. #CyberDeflategate and the beginning of sports hacking (Christian Science Monitor)
8. Restraint is the best weapon against Chinese hacks (Christian Science Monitor)
9. Even if flawed, cybertheft deal with China a win for Obama
10. Did China Just Hack the International Court Adjudicating Its South China Sea Territorial Claims? (The Diplomat)
11. Poisoning the Internet won't stop more Paris attacks (CSM Passcode)
12. What's Next for Putin in Ukraine? Cyber Escalation (NATO CCDCOE – Book Chapter)
13. How NSA Reorganization could squander remaining trust (CSM Passcode)
14. Setting Priorities on Cybersecurity (Democracy Journal)
15. Why the FBI will eventually reveal its iPhone hack to Apple (CSM Passcode)
16. Winning and Losing in Cyberspace (NATO CCDCOE)
17. Chinese cyberespionage is down. That's a win for Obama's diplomacy (CSM Passcode)