

Benjamin Kaiser

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EDUCATION

Ph.D., Computer Science September 2018 – Present
Princeton University, Princeton, NJ
Advisor: Professor Jonathan Mayer
GPA 3.93

M.S., Computer Science September 2013 – May 2015
Rensselaer Polytechnic Institute, Troy, NY
Advisor: Professor Ana Milanova
GPA 3.67
Activities: Group and private tutor, TA, secretary of RPISEC security group

B.S., Computer Science September 2011 – May 2015
Rensselaer Polytechnic Institute, Troy, NY
GPA 3.67

A.S., Computer Information Systems September 2009 – May 2011
State University of New York at Cobleskill, Cobleskill, NY
GPA 3.59

EXPERIENCE

Graduate Research Assistant, Center for Information Technology Policy September 2018 – Present
Princeton University, Princeton, NJ

- Conducting interdisciplinary research into online disinformation with researchers in Sociology and Politics. Project details provided below under *Ongoing Projects*.
- Leading research implementation for a project funded by the Project X Innovation Fund and the Facebook Online Safety Benchmark Fund.
- Developing tool to scrape websites, replay their content for fully offline browsing, and facilitate annotation of those websites. The tool is to be used in HCI and UX studies and released publicly.
- Presented security research results to stakeholders at FCC, Senate offices, and an industry association to spur policy action on telecom security.
- Mentoring undergraduate (Jiayang Li) and Master's (Jerry Wei) researchers.
- Organizing weekly Work-in-Progress talk series

Associate Technical Staff, Secure Resilient Systems and Technologies Group June 2015 – August 2018
MIT Lincoln Laboratory, Lexington, MA

- As principal investigator, led a project to design and implement a formally verified, correct-by-construction secure software update tool for satellites. Delivered prototype tool to Air Force sponsor.
- Designed and implemented a decentralized cryptographic access control scheme to be used for cloud data security in the Department of Defense.
- Participated in a massive multi-stakeholder process developing an architecture design and requirements for a holistic security architecture to be deployed to 400+ Federal agencies.
- Surveyed over 100 analysis and research papers to systematize viable applications of blockchain technology for the Department of Defense.

- Developed a formal framework for reasoning about binary protection and program analysis. Proved impossibility of perfect binary obfuscation against program analysts. Published two conference papers.

PROJECTS

Prepublication

- A. Hounsel, J. Holland, **B. Kaiser**, K. Borgolte, N. Feamster, and J. Mayer. Disinfotron: Early and Progressive Detection of Online Disinformation. In submission to IEEE S&P 2020.

We implement an automated system that detects new disinformation campaigns at key stages in their lifecycles, including early stages where a website domain has been registered and configured but no content has yet been generated or spread. Disinfotron uses domain, certificate, and hosting features to classify websites as either disinformation, news, or lacking news content. My contributions include compiling and managing the training dataset, developing features, and analyzing results to understand and improve system performance.

- K. Lee, **B. Kaiser**, A. Narayanan, J. Mayer. Authentication Vulnerabilities in Mobile SIM Swap Procedures. Preparing for submission to SOUPS 2020.

We examine how wireless carriers protect customers from SIM swap attacks and discovered a new vulnerability that allows trivial compromise of prepaid wireless accounts by an adversary armed only with a victim's name and phone number. As part of an effort to develop policy solutions for this urgent consumer safety issue, we presented our findings and recommendations to stakeholders in regulatory roles (FCC and Senate offices) and industry advocacy groups (CTIA). I contributed by designing of the research methods, executing portions of the study, and developing and carrying out a policy action strategy.

Peer Reviewed

- S. Ruoti, **B. Kaiser**, A. Yerukhimovich, J. Clark, and R. Cunningham (2019). Blockchain Technology: What Is It Good for? ACM Queue, Volume 17 Issue 5, December 2019, Journal
- J. Blackthorne, **B. Kaiser**, and B. Yener (2016). A Formal Framework for Environmentally Sensitive Malware. In Research in Attacks, Intrusions, and Defenses, RAID 2016. Lecture Notes in Computer Science, vol 9854.
- J. Blackthorne, **B. Kaiser**, B. Fuller, and B. Yener (2017). Environmental Authentication in Malware. 6th International Conference on Cryptology and Information Security in Latin America, La Habana, Cuba, September 20-22, 2017, Proceedings
- J. Blackthorne, **B. Kaiser**, and B. Yener (2016). A Formal Framework for Environmentally Sensitive Malware. In Research in Attacks, Intrusions, and Defenses, RAID 2016. Lecture Notes in Computer Science, vol 9854.
- V. Gadepally, B. Hancock, **B. Kaiser**, J. Kepner, P. Michaleas, M. Varia, and A. Yerukhimovich, Computing on Masked Data to improve the security of big data, 2015 IEEE International Symposium on Technologies for Homeland Security (HST), Waltham, MA, 2015, pp. 1-6. doi: 10.1109/THS.2015.7225312

Other Published Work

- **B. Kaiser**, M. Jurado, and A. Ledger (2018). The looming threat of China: An analysis of Chinese influence on Bitcoin. arXiv preprint arXiv:1810.02466.
- G. Itkis, **B. Kaiser**, J. Coll, W. Smith, and R. Cunningham, Charting a Security Landscape in the Clouds: Data Protection and Collaboration in Cloud Storage, Technical Report 1210, MIT Lincoln Laboratory, Lexington, MA, July 2016.

- **B. Kaiser** (2015). A context-sensitive security type system for Java (Master's Thesis). Available from ProQuest Dissertations and Theses database. (UMI No. 1590111)

PRESENTATIONS

- Analyzing China's Influence over Bitcoin, Cryptoeconomics Security Conference (CESC) 2018.
Slides available at <https://goo.gl/1Jt8uN>
- A Formal Framework for Environmentally Sensitive Malware, International Symposium on Research in Attacks, Intrusions and Defenses (RAID) 2016.
Slides available at <https://goo.gl/sgw1VC>

VOLUNTEER

- Co-founded CodeCreative, a free summer program teaching basic computer science skills to students from underserved schools in Boston. Developed a curriculum from scratch, led weekly lessons, and mentored students through two 8-week sessions.
- Taught topics in theoretical cryptography to gifted high school students at LLCipher, a summer program coordinated by MIT Lincoln Laboratory.
- Taught information security fundamentals to the STEM club at Emma Willard, a private high school for girls in Troy, NY.