

Kevin Liao

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EDUCATION

B.S. Computer Science

Arizona State University

(expected) May 2017

Tempe, AZ

Thesis: Toward Inductive Reverse Engineering of Web Applications (in progress)

Committee: Adam Doupé (Chair), Gail-Joon Ahn, Ziming Zhao

GPA: 4.00/4.00

RESEARCH INTERESTS

- Computer security & privacy
- Applied cryptography
- Program analysis/synthesis
- Cryptographic currencies

PUBLICATIONS

Peer-Reviewed Publications

- [C1] **Kevin Liao** and Jonathan Katz. *Incentivizing Blockchain Forks via Whale Transactions*. To appear at the 4th Workshop on Bitcoin and Blockchain Research (BITCOIN).
- [C2] **Kevin Liao**, Ziming Zhao, Adam Doupé, and Gail-Joon Ahn. "Behind Closed Doors: Measurement and Analysis of CryptoLocker Ransoms in Bitcoin". In: *Proceedings of the Symposium on Electronic Crime Research (eCrime)*. June 2016.

Works In Submission

- [S1] **Kevin Liao**, Tejas Khairnar, and Adam Doupé. *Toward Inductive Reverse Engineering of Web Applications*.

Book Chapters

- [BC1] **Kevin Liao**, Ziming Zhao, Adam Doupé, and Gail-Joon Ahn. "Ransomware and Cryptocurrency: Partners in Crime". In: *Cybercrime Through an Interdisciplinary Lens*. Ed. by Thomas J. Holt. Advances in Intelligent Systems and Computing. Routledge, 2016.

Posters

- [P1] **Kevin Liao**, Tejas Khairnar, Adam Doupé, Ziming Zhao, and Gail-Joon Ahn. *Next Generation Black-Box Vulnerability Analysis Framework*. *Workshop on Information Assurance Research and Education, ASU*. October 2016.
- [P2] Anupam Panwar, Ajay Modi, Jangwon Yie, **Kevin Liao**, Sajid Anwar, Wonkyu Han, Daniel Martin, Kyungyong Han, Ziming Zhao, Adam Doupé, and Gail-Joon Ahn. *Threat Intelligence Analytics (TIA): Assembling the Jigsaw Puzzles of Cybercrimes*. *Workshop on Information Assurance Research and Education, ASU*. November 2015.

RESEARCH EXPERIENCE

Undergraduate Research Assistant

Maryland Cybersecurity Center, University of Maryland
Advisor: Jonathan Katz

Jun 2016 – Aug 2016
College Park, MD

- Project:
 - We propose and formalize the *whale attack*, in which a minority attacker increases her chances of double-spending by incentivizing miners to subvert the consensus protocol and to collude via *whale transactions*, or transactions carrying anomalously large fees. We analyze the expected cost to carry out the attack, and simulate the attack under realistic system parameters. Our results show that double-spend attacks, conventionally thought to be impractical for minority attackers, can actually be financially feasible and worthwhile under the whale attack.
Publications: [C1]
- Sponsors
 - National Science Foundation

Undergraduate Research Assistant

Security Engineering for Future Computing Lab, Arizona State University
Advisors: Gail-Joon Ahn, Adam Doupé

Mar 2015 – Present
Tempe, AZ

- Projects:
 - We introduce a novel application of inductive programming, which we call *inductive reverse engineering (IRE)*, to automatically reverse engineer an abstraction of the web application's code in a completely black-box manner. We develop a **Python** prototype of our IRE approach, which can synthesize simple, stateless web applications. In the future, we plan to extend IRE to stateful web applications and integrate a static analysis platform to detect vulnerabilities.
Publications: [S1] [P1]
 - We perform a measurement analysis of CryptoLocker within the Bitcoin ecosystem from September 5, 2013 through January 31, 2014. Using information collected from online fora, such as reddit and BitcoinTalk, as an initial starting point, we generate a cluster of 968 Bitcoin addresses belonging to CryptoLocker and collect transaction data using **Python** scripts and the **Blockchain API**. We provide a lower bound for CryptoLocker's economy in Bitcoin, and analyze ransom payment timestamps both longitudinally across CryptoLocker's operating period and transversely across times of day.
Publications: [C2] [BC1] [P2]
- Sponsors
 - Fulton Undergraduate Research Initiative

TEACHING EXPERIENCE

Course Designer

First Gen Scientists

Jul 2016 – Dec 2016
Tempe, AZ

- Developed curriculum for an introductory computer science course serving at-risk children from under-served communities.

Undergraduate Teaching Assistant

Arizona State University

Aug 2014 – Present
Tempe, AZ

- CSE 220 Programming for Computer Engineering with Dr. Yinong Chen: Spring 2017.
- CSE 240 Introduction to Programming Languages with Dr. Yinong Chen: Fall 2016.
- CSE 110 Introduction to Programming with Dr. Yoshi Kobayashi: Fall 2014.