

Joshua Reynolds

Assistant Professor

Department of Computer Science
New Mexico State University
Las Cruces, New Mexico 88003

SUMMARY

I am an assistant professor in the CS department at New Mexico State University. I have collaborated with researchers at Google, UC Berkeley, Cloudflare, GA Tech, and Stanford on research in the areas of two-factor authentication (2FA), phishing, and transport-layer security (TLS). My work has been published in top academic security conferences including USENIX and IEEE S&P (Oakland) and the security track of ACM CHI.

EDUCATION

Doctor of Philosophy, Computer Science

University of Illinois at Urbana-Champaign, Urbana, IL
GPA 3.96

December 2022

Bachelor of Science, Computer Science, *Summa Cum Laude*

Brigham Young University, Provo, UT
GPA 3.99

August 2017

PUBLICATIONS

- “*URL Complexity Causes Location Ambiguity in HTTP for Both Humans and Machines*,” **Joshua Reynolds**, Michael Bailey (committee chair), Adam Bates, Kent Seamons, Karl Gunter. Doctoral Dissertation published at UIUC
- “*Equivocal URLs: Understanding the Fragmented Space of URL Parser Implementations*,” **Joshua Reynolds**, Adam Bates, Michael Bailey; ESORICS 2022; *Best Paper Award* (562 submitted, 104 accepted (18.5%))
- “*Empirical Measurement of Systemic 2FA Usability*,” **Joshua Reynolds**, Nikita Samarin, Joseph Barnes, Taylor Judd, Joshua Mason, Michael Bailey, Serge Egelman; USENIX Security 2020; 473 submitted, 63 accepted (13.3%)
- “*Measuring Identity Confusion with Uniform Resource Locators*,” **Joshua Reynolds**, Deepak Kumar, Zane Ma, Rohan Subramanian, Meishan Wu, Martin Shelton, Joshua Mason, Emily Stark, Michael Bailey; ACM CHI 2020; 3126 submissions, 760 accepted (24.3%)
- “*The Impact of Secure Transport Protocols on Phishing Efficacy*,” Zane Ma, **Joshua Reynolds**, Joey Dickinson, Kaishen Wang, Taylor Judd, Joseph Barnes, Joshua Mason, Michael Bailey; USENIX CSET 2019; 61 submissions, 19 accepted (31.1%)
- “*A Tale of Two Studies: The Best and Worst of YubiKey Usability*,” **Joshua Reynolds**, Trevor Smith, Ken Reese, Luke Dickinson, Scott Ruoti, Kent Seamons; IEEE Security and Privacy (Oakland) 2018; 549 submissions, 49 accepted, 14 resubmissions accepted (11.5%)
- “*A Usability Study of Secure Email Deletion*,” Tyler Monson, **Joshua Reynolds**, Trevor Smith, Daniel Zappala, Scott Ruoti, Kent Seamons; European Workshop on Usable Security 2018; 47% acceptance rate

- “*TrustBase: An Architecture to Repair and Strengthen Certificate-based Authentication*,” Mark O’Neill, Scott Heidbrink, Scott Ruoti, Jordan Whitehead, Dan Bunker, Luke Dickinson, Travis Hendershot, **Joshua Reynolds**, Kent Seamons, Daniel Zappala; USENIX Security 2017; 522 submissions, 85 accepted (16.3%)

TEACHING

- CS 479/579 Reverse Engineering *New Course Creation* (12 students, 3 credits) Spring 2023
- CS 171G Introduction to Computer Science (49 students, 4 credits) Spring 2023
- CS 484/504 Computer Networks I (20 students, 3 credits) Fall 2022
- CS 171G Introduction to Computer Science (53 students, 4 credits) Spring 2022
- Graduate TA - ECE 422/CS 461 ”Security 1” (125 students, 4 credits, 5 semesters) Fall 2019 - Fall 2021
- Graduate TA - ECE 498 ”E-Crime and Internet Service Abuse” (40 Students, 2 credits, 1 semester) Fall 2018

SERVICE

- Student Secretary: RAID 2018 PC
- Undergraduate Intern Mentor: Summer 2018
- Undergraduate Intern Mentor (x2): Spring 2019
- External Peer Review: CHI 2021
- External Peer Review: ToCHI 2021
- External Peer Review: IEEE TNSE 2022
- External Peer Review: CHI 2023
- External Peer Review: ToN 2023
- Posters Co-Chair, USENIX SOUPS 2023 & 2024
- Cybersecurity Hiring Committee for Fall 2023
- Cybersecurity B.S. Degree Point-of-Contact

SPEAKING

- “A Tale of Two Studies: The Best and Worst of YubiKey Usability” - 5/24/18 @ IEEE Symposium on Security and Privacy, Oakland, California
- “Password Cracking” - 11/14/18 @ Applied Cryptography & E-Crime and Internet Service Abuse combined lecture at UIUC

- “Measurement of UCB’s 2FA Deployment” - 8/7/2019 @ UC Berkeley IT Leadership Group
- “MFA Research Presentation” - 9/25/19 @ UIUC IT Security Group
- “Empirical Measurement of Systemic 2FA Usability” - 6/27/20 @ USENIX Security
- “Empirical Measurement of Systemic 2FA Usability” - 7/2/21 @ VMWare
- “Understanding URL Parsing to Equivocate on Web Identity” - 11/30/21 NMSU
- “Equivocal URLs: Understanding the Fragmented Space of URL Parser Implementations” 9/28/22 @ ESORICS 2022, Copenhagen, Denmark
- “Equivocal URLs: Understanding the Fragmented Space of URL Parser Implementations” 10/7/22 @ NMSU CS Colloquium
- “URL Location Ambiguity” 10/20/22 @ University of Illinois at Urbana-Champaign (remote) Dissertation Defense
- “URL Parsing Ambiguity” 11/4/22 @ New Mexico Tech CS Colloquium

PROFESSIONAL EXPERIENCE AND COLLABORATIONS

Cloudflare Summer & Fall 2020
Graduate Research Intern, Remote, USA

- Developed a privacy-preserving collection methodology to study the properties of billions of URLs.

UC Berkeley International Computer Science Institute - BLUES Lab Summer 2019
Graduate Research Intern, Berkeley, CA, USA

- Analyzed the organizational impact of 2FA implementation using data from collaborators at UIUC and UCB
- Presented findings to senior IT leadership at UIUC and UCB

University of Illinois Information Trust Institute - Network and Security Research Group Fall 2017-Spring 2019
Graduate Research Assistant, Urbana, IL, USA

- Supported UIUC IT department phishing drill and subsequent publication of impacts on HTTP vs HTTPS links
- Collected and analyzed next-generation APK signatures in 100TB+ collection of 6M+ Android apps in multithreaded Golang
- External Validation of proof-of-concept exploits on various Android phones for Johnson et al. at Kryptowire
- Collaborated with Google Chrome to study URL readability
- Collaborated with UC Berkeley to study the organizational costs of two-factor authentication
- Mentored three undergraduate researchers

Brigham Young University Internet Security Research Lab Fall 2016 - Summer 2017
Undergraduate Research Assistant, Provo, UT, USA

- Supported TLS and encrypted email research projects
- Developed and executed an experiment to qualitatively measure barriers to adoption of USB hardware keys for two-factor authentication.

Lucid Software Co.

Summer 2016

Software Engineering Intern, South Jordan, UT, USA

- Scala microservice optimization: lucidchart.com/techblog/2016/08/29/

Brigham Young University Center for Teaching and Learning

Summer 2015 - Spring 2016

Student Software Developer, Provo, UT, USA

- PHP & MySQL back-end development (WAMP stack) for university's home-grown Learning Management System

MEMBERSHIPS

ACM

IEEE

HONORS & FUNDING

- Heritage full tuition scholarship, Brigham Young University
- Full tuition assistantship, University of Illinois at Urbana-Champaign
- IEEE Security and Privacy (Oakland) Travel Grant 2018
- State Farm Doctoral Fellowship AY 2018-2019
- List of Teachers Ranked as Excellent by Their Students, Fall 2020
- Best Paper Award, 500 Euro prize, ESORICS 2022
- "Building a Federated Learning Framework for Trustworthy and Resilient Energy Internet of Things (eIoT) Infrastructure" *Co-PI* \$750,000, 2023-2025
- Cybersecurity Group Equipment Grant, \$30,000 February 2022, Fordham CEDI Cybersecurity Center Equipment Grant
- CAHSI REU Mentor (funds 1 undergraduate RA per semester plus a faculty stipend), Fall 2022 & Spring 2023

LANGUAGES

English – native

Spanish – conversant