

Dhruv Kuchhal

Senior Research Scientist at PayPal
dkuchhal@pm.me

February 7, 2024
dhruvkuchhal.com
Google Scholar

ABOUT ME

I specialize in large-scale investigations of Web-based security and privacy issues. Using data-driven approaches, my work reveals the impact of real-world systems on end user security, and leads to designing better solutions. My methods include Internet/Web-wide measurements, network traffic analysis, and large-scale data mining.

INDUSTRY WORK EXPERIENCE

- **PayPal, Inc.** Scottsdale, AZ
Senior Research Scientist, Manager: Dr. Adam Oest. *August 2023 - Present*
 - Developing capabilities for risk monitoring, such as passkey fraud trends.
 - Building data pipelines for scam merchant detection. Established a strategic collaboration with GASA.
 - Designing solutions for early fraud alerting based on threat intelligence from Telegram.
 - SME on policy issues such as Authentication and related Anti-Trust legislation in the EU.
- **PayPal, Inc.** Scottsdale, AZ
Information Security PhD Intern, Manager: Dr. Adam Oest. *Summers of 2021 and 2022*
 - Measured security characteristics of FIDO2 deployments across the Web, and combined it with internal measurements of auth systems at PayPal, to study practical risks to FIDO2 (attacks & defenses).
 - Reported a bug in Google Chrome that could be exploited to trick a user enrolled in WebAuthn into authenticating an attacker-controlled sensitive action on their account. [Chromium Issue 1341134].
 - Socialized findings with the various affected deployments, and received recognition from the FIDO Alliance, in terms of a security bulletin attributing the attack to our work.
 - Full paper accepted and presented at ACM CCS 2023.

ACADEMIC WORK EXPERIENCE

- **Georgia Institute of Technology (GT)** Atlanta, GA
PhD Candidate, Advisor: Prof. Frank Li. *2019 - 2023*
 - (Web Privacy) Investigated privacy-invasive local network communication by websites. Identified unique anti-bot and anti-fraud behavior in the top 100K websites.
 - (Web Abuse) Studied dynamics of real-world view fraud campaigns. Deconstructed and analyzed the working of a complex network of ad aggregators enabling the fraud.
 - (Web Security) Analyzed practical security of real-world FIDO2 deployments. Identified weaknesses in several real-world deployments, and socialized our findings with the stakeholders.
 - (Web Privacy) Identified the unsafe usage of WebViews to display 3rd-party web content in Android apps.
- **University of Maryland, College Park** College Park, MD
Research Assistant, Advisor: Prof. Michelle Mazurek. *2018 - 2019*
 - Evaluated response biases in security user studies.
 - Developed tools to measure the readability of security advice.
- **Indraprastha Institute of Information Technology** Delhi, India
Research Associate, Advisor: Prof. Ponnurangam Kumaraguru. *2017 - 2019*
 - Analyzed misinformation on end-to-end encrypted platforms such as WhatsApp.
 - Characterized spam campaigns abusing phone numbers on online social networks.

HIGHEST EDUCATION

- **Georgia Institute of Technology** Atlanta, GA
Doctor of Philosophy in Computer Science. Advised by Prof. Frank Li. *2019 - 2023*

SELECTED PUBLICATIONS

CONFERENCE

- **Kuchhal, D.**, Ramakrishnan, K., and Li, F.,
Whatcha Lookin' At: Investigating Third-Party Web Content in Popular Android Apps.
Currently under review.
- **Kuchhal, D.**, Saad, M., Oest, A., and Li, F.,
Evaluating the Security Posture of Real-World FIDO2 Deployments.
ACM Conference on Computer and Communications Security (CCS), 2023.
Acceptance Rate: 19.1% (234/1222) [[dl.acm.org](#)][[pdf](#)]
- **Kuchhal, D.** and Li, F.,
A View into YouTube View Fraud.
ACM Web Conference (WWW), 2022.
Acceptance Rate: 17.7% (323/1822) [[dl.acm.org](#)] [[pdf](#)] [[video](#)]
- **Kuchhal, D.** and Li, F.,
Knock and Talk: Investigating Local Network Communications on Websites.
ACM Internet Measurement Conference (IMC), 2021.
Acceptance Rate: 27% (53/196) [[dl.acm.org](#)] [[pdf](#)] [[video](#)]
- Gupta, S., **Kuchhal, D.**, Gupta, P., Ahamad, M., Gupta, M. and Kumaraguru, P.,
Under the Shadow of Sunshine: Characterizing Spam Campaigns Abusing Phone Numbers Across Online Social Networks*.
ACM Conference on Web Science (WebSci), 2018.
Acceptance Rate: 27% (30/113) [[dl.acm.org](#)] [[pdf](#)]
Award: Runner up for Best Student Paper

ACHIEVEMENTS/HONORS

- **FIDO Alliance:** A security bulletin was distributed by the FIDO Alliance, emphasizing our threat model and attacks.
- **Y Combinator 2023:** Admitted to the Summer 2023 batch (1.5% acceptance rate; USD 500k pre-seed investment), to innovate on a GenAI-hardened replacement for CAPTCHAs on the Web.
- **RSAC Security Scholar 2023:** Selected among 50 cybersecurity students across US to attend the RSA Conference.
- **Conference Travel Grants:** Awarded funds to travel to and attend ACM CCS 2018 and PETS 2022.
- **USC Annenberg Fellowship, 2019:** Received a 4-year top-up fellowship for a CS PhD at USC (top 1% of admits).
- **Smart India Hackathon, 2017:** Our team of 6 members, advised by [Dr. Sambuddha Roy](#) won the first prize at India's national hackathon (10k+ students), with a cash prize of Rs. 1 lakh awarded by Government of India. [[GitHub](#)]
- **Recognition of Service Award - ACM, 2016:** For serving as founding Chair for an ACM Student Chapter.

SERVICE

- **PETS:** External Reviewer, 2022-2023. Publication Co-Chair, 2023 and 2024. PC Member, 2024.
- **ACM WebConf (WWW):** PC Member, 2024.
- **ACM IMC:** PC Member, 2024.
- **Georgia Tech School of Cybersecurity and Privacy:** Member, Faculty Recruiting Committee, 2022.
- **Georgia Tech School of Computer Science:** Founding Communications Chair of GSA, 2021-22 AY.

TECHNOLOGIES

Python, MongoDB, BigQuery, Wireshark, mitmproxy, ChromeDevTools, C++.

REFERENCES

Dr. Adam Oest (Manager, PayPal; aoest@asu.edu), **Prof. Frank Li** (PhD Advisor, GT; frankli@gatech.edu).