

# Dhruv Kuchhal

Senior Research Scientist at PayPal  
dkuchhal@pm.me

February 14, 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 GenAI-based 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](mailto:aoest@asu.edu)), **Prof. Frank Li** (PhD Advisor, GT; [frankli@gatech.edu](mailto:frankli@gatech.edu)).