

# Deepak Kumar

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## Research Overview

My research focuses on *sociotechnical cybersecurity*—a subarea of security that deals with threats at the interface of society and technology. I measure how such threats are operationalized online (i.e., through empiricism) and propose new defenses, tools, and interventions that can keep Internet users safe from unwanted harms.

## Positions

Assistant Professor, Computer Science & Engineering, UC San Diego, July 2024—

## Education and Training

Postdoctoral researcher, Stanford University, 2020—2023.

*Advisor:* Zakir Durumeric

Ph.D. Computer Science, University of Illinois, Urbana-Champaign, August 2020.

Dissertation: A Principled Approach to Measuring the IoT Ecosystem.

*Advisor:* Michael Bailey

*Committee:* Zakir Durumeric, Nikita Borisov, Adam Bates, Gang Wang.

B.S Computer Science, University of Michigan, 2016.

## Conference Publications

29. **Long Story Short: Auditing US Political Polarization in Recommendations for Long- vs. Short-form Videos on YouTube**  
Shaokang Jiang, Arshia Arya, Seoyoung Kweon, Ivan Liang, Deepak Kumar and Kristen Vaccaro  
ACM Web Conference. April 2026.
28. **Stop the Nonconsensual Use of Nude Images in Research**  
Princessa Cintaqia, Arshia Arya, Elissa M Redmiles, Deepak Kumar, Allison McDonald, Lucy Qin  
Conference on Neural Information Processing Systems (NeurIPS). December 2025.
27. **What Comes After Harm? Mapping Reparative Actions in AI through Justice Frameworks**  
Sijia Xiao, Haodi Zou, Alice Qian Zhang, Deepak Kumar, Hong Shen, Jason Hong, Motahhare Eslami  
AAAI / ACM Conference on Artificial Intelligence, Ethics, and Society, October 2025.
26. **Abuse in the Name of “Safety”: Stop the Non-consensual Use of Intimate Images in Research**  
Princessa Cintaqia, Arshia Arya, Elissa M. Redmiles, Deepak Kumar, Allison McDonald, Lucy Qin  
AAAI / ACM Conference on Artificial Intelligence, Ethics, and Society, October 2025.

25. **Characterizing the MrDeepFakes Sexual Deepfake Marketplace**  
Catherine Han, Anne Li, Deepak Kumar, Zakir Durumeric  
USENIX Security Symposium (USENIX), August 2025.
24. **PressProtect: Helping Journalists Navigate Social Media in the Face of Online Harassment**  
Catherine Han, Anne Li, Deepak Kumar, Zakir Durumeric  
ACM Conference on Computer-Supported Cooperative Work and Social Computing (CSCW), November 2024.
23. **Watch Your Language: Investigating Content Moderation with Large Language Models**  
Deepak Kumar, Yousef AbuHashem, Zakir Durumeric  
AAAI International Conference on Web and Social Media (ICWSM), June 2024.
22. **Specious Sites: Tracking the Spread and Sway of Spurious News Stories at Scale**  
Hans Hanley, Deepak Kumar, Zakir Durumeric  
IEEE Symposium on Security & Privacy (Oakland), May 2024.
21. **Do Users Write More Insecure Code with AI Assistants?** Neil Perry, Megha Srivastava, Deepak Kumar, Dan Boneh  
ACM Conference on Computer and Communications Security (CCS), November 2023.
20. **A Golden Age: Conspiracy Theories' Relationship with Misinformation Outlets, News Media, and the Wider Internet**  
Hans Hanley, Deepak Kumar, Zakir Durumeric  
ACM Conference On Computer-Supported Cooperative Work And Social Computing (CSCW), October 2023.
19. **Hate Raids on Twitch: Echoes of the Past, New Modalities, and Implications for Platform Governance**  
**Best Paper Award!**  
Catherine Han, Joseph Seering, Deepak Kumar, Jeff Hancock, Zakir Durumeric  
ACM Conference On Computer-Supported Cooperative Work And Social Computing (CSCW), October 2023.
18. **Detecting DNS Manipulation using TLS Certificates** Elisa Tsai, Deepak Kumar, Ram Sundara Raman, Gavin Li, Yael Eiger, Roya Ensafi  
Privacy Enhancing Technologies Symposium (PETS) 2023, July 2023.
17. **Happenstance: Utilizing Semantic Search to Track Russian State Media Narratives about the Russo-Ukrainian War On Reddit**  
Hans Hanley, Deepak Kumar, Zakir Durumeric  
AAAI International Conference on Web and Social Media (ICWSM), June 2023.
16. **Understanding the Behaviors of Toxic Accounts on Reddit** Deepak Kumar, Jeff Hancock, Kurt Thomas, Zakir Durumeric  
ACM Web Conference (WebConf), May 2023.
15. **“A Special Operation”: A Quantitative Approach to Dissecting and Comparing Different Media Ecosystems’ Coverage of the Russo-Ukrainian War**  
Hans Hanley, Deepak Kumar, Zakir Durumeric  
AAAI International Conference on Web and Social Media (ICWSM), June 2023.
14. **Toppling Top Lists: Evaluating the Accuracy of Popular Website Lists**  
Kimberly Ruth, Deepak Kumar, Brandon Wang, Luke Valenta, Zakir Durumeric.  
ACM Internet Measurement Conference (IMC '22). October 2022.

13. **On the Infrastructure Providers that Support Misinformation Websites**  
 Catherine Han, Deepak Kumar, Zakir Durumeric  
 AAAI International Conference on Web and Social Media (ICWSM), Atlanta, GA. June 2022.
12. **No Calm in the Storm: Investigation QAnon Website Relationships**  
 Hans Hanley, Deepak Kumar, Zakir Durumeric  
 AAAI International Conference on Web and Social Media (ICWSM), Atlanta, GA. June 2022.
11. **Measuring DNS-over-HTTPS Performance Around the World**  
 Rishabh Chhabra, Paul Murley, Deepak Kumar, Michael Bailey, Gang Wang  
 ACM Internet Measurement Conference (IMC '21), Virtual, November 2021.
10. **Designing Toxic Content Classification for a Diversity of Perspectives**  
 Deepak Kumar, Patrick Gage Kelley, Sunny Consolvo, Joshua Mason, Elie Bursztein, Zakir Durumeric, Kurt Thomas, Michael Bailey  
 USENIX Symposium on Usable Privacy and Security (SOUPS '21), Virtual, August 8 - 10, 2021.
9. **SoK: Hate, Harassment, and the Changing Landscape of Online Abuse**  
 Kurt Thomas, Devdatta Akhawe, Michael Bailey, Elie Bursztein, Dan Boneh, Sunny Consolvo, Nicki Dell, Zakir Durumeric, Patrick Gage Kelley, Deepak Kumar, Damon McCoy, Sarah Meiklejohn, Thomas Ristenpart, Gianluca Stringhini  
 IEEE Symposium on Security and Privacy (Oakland '21), Virtual, May 23 - 27, 2021.
8. **Measuring Identity Confusion with Uniform Resource Locators**  
 Joshua Reynolds, Deepak Kumar, Zane Ma, Rohan Subramaniam, Meishan Wu, Martin Shelton, Joshua Mason, Emily Stark, Michael Bailey  
 ACM Computer and Human Interaction Conference (CHI) 2020, Virtual.
7. **All Things Considered: An Analysis of IoT Devices on Home Networks**  
 Deepak Kumar, Kelly Shen, Benton Case, Deepali Garg, Galina Alperovich, Dmitry Kuznetsov, Rajarshi Gupta, Zakir Durumeric  
 USENIX Security Symposium (USENIX '19), Santa Clara, California. Aug 14 - 16, 2019.
6. **Skill Squatting Attacks on Amazon Alexa**  
 Deepak Kumar, Riccardo Paccagnella, Paul Murley, Eric Hennenfent, Joshua Mason, Adam Bates, Michael Bailey  
 USENIX Security Symposium (USENIX '18), Baltimore, Maryland. Aug 15 - 17, 2018.
5. **Erays: Reverse Engineering Ethereum's Opaque Smart Contracts**  
 Yi Zhou, Deepak Kumar, Surya Bakshi, Joshua Mason, Andrew Miller, Michael Bailey  
 USENIX Security Symposium (USENIX '18), Baltimore, Maryland. Aug 15 - 17, 2018.
4. **SoK: "Plug & Pray" Today – Understanding USB Insecurity in Versions 1 through C**  
 Dave (Jing) Tian, Nolen Scaife, Deepak Kumar, Michael Bailey, Adam Bates, Kevin R. Butler  
 IEEE Security and Privacy Symposium (Oakland '18), San Francisco, California. May 21 - 23, 2018.
3. **Tracking Certificate Misissuance in the Wild**  
 Deepak Kumar, Zhengping Wang, Matthew Hyder, Joseph Dickinson, Joshua Mason, Michael Bailey, Gabrielle Beck, David Adrian, Zakir Durumeric, J. Alex Halderman  
 IEEE Security and Privacy Symposium (Oakland '18), San Francisco, California. May 21 - 23, 2018.
2. **Understanding the Mirai Botnet**  
 Manos Antonakakis, Tim April, Michael Bailey, Matt Bernhard, Elie Bursztein, Jaime Cochran, Zakir Durumeric, J. Alex Halderman, Luca Invernizzi, Michalis Kallitsis, Deepak Kumar, Chaz Lever, Zane

Ma, Joshua Mason, Damian Menscher, Chad Seaman, Nick Sullivan, Kurt Thomas, Yi Zhou. USENIX Security Symposium (USENIX Security '17), Vancouver, Canada, August 16-18, 2017.

1. **Security Challenges in an Increasingly Tangled Web**

Deepak Kumar, Zane Ma, Zakir Durumeric, Ariana Mirian, Joshua Mason, Michael Bailey, and J. Alex Halderman.

World Wide Web Conference (WWW'17). Perth, Australia. April 3 - 7, 2017.

## Other Publications

4. **Treating Online Abuse Like Spam**

Yael Grauer, Deepak Kumar, Viktoriya Vilk

PEN America and Consumer Reports, May 2025.

<https://pen.org/report/treating-online-abuse-like-spam/>

3. **(Mis)use of Nude Images in Machine Learning Research**

Arshia Arya, Princessa Cintaqia, Deepak Kumar, Allison McDonald, Lucy Qin, Elissa M. Redmiles  
EvalEval Workshop at NeurIPS, December 2024.

2. **Quantifying the Systematic Bias in the Accessibility and Inaccessibility of Web Scraping Content from URL-Logged Web-Browsing Digital Trace Data**

Ross Dahlke, Deepak Kumar, Zakir Durumeric, Jeff Hancock  
In Social Science Computer Review.

1. **Emerging Threats in IoT Voice Services**

Deepak Kumar, Riccardo Paccagnella, Paul Murley, Eric Hennenfent, Joshua Mason, Adam Bates, and Michael Bailey

In IEEE Security & Privacy Magazine. July 9, 2019.

## Teaching

The Modern Internet (CS 249i), Stanford University

**Terms:** Fall 2021

**Responsibilities:** Helped to create a new advanced networking course that covers how the Internet has evolved and operates today. Responsible for three lectures and one project (approximately 1/4 of the overall course.)

Introduction to Computer Security (CS 461), University of Illinois

**Terms:** Spring 2017, Fall 2019, Spring 2020

**Responsibilities:** Graduate TA responsible for course administration, office hours, section leading, grading, exam creation, and guest lectures. In Fall 2019, I helped to redesign the syllabus for the class in collaboration with the instructor.

Introduction to Computer Security (EECS 388), University of Michigan

**Terms:** Fall 2015, Winter 2016.

**Responsibilities:** Undergraduate TA responsible for section leading, office hours, and exam administration.

ICOS Big Data Bootcamp, University of Michigan

**Terms:** Summer 2016

**Responsibilities:** Taught introductory computer science lectures for summer course designed to introduce humanities graduate students to using computing for research.

## Service

Program Committee. AAAI International Conference on Web and Social Media 2024.

Program Committee. ACM Conference on Computer & Communications Security, 2024.

Program Committee. Privacy Enhancing Technologies Symposium, 2024.

Program Committee. IEEE Symposium on Security & Privacy, 2024.

Program Committee. AAAI International Conference on Web and Social Media 2023.

Program Chair and Founding Organizer. 1st IEEE Workshop on Security for Harassment Online, Protections, and Empowerment (SecHOPE), 2023.

Program Committee. ACM Web Conference 2023, Web & Society Track.

Program Committee. AAAI International Conference on Web and Social Media 2022.

Program Committee. USENIX Security Symposium 2022.

Program Committee. USENIX Security Symposium 2021.

Web Chair. AAAI International Conference on Web and Social Media 2022.

I have also served as an external reviewer for USENIX Security (2018–2020), ACM Internet Measurement Conference (2019–2020), and AAAI ICWSM (2022–2023).

## Grants and Awards

**Google GARA Trust & Safety Research Award**, Automated Conversational Interventions to Curb Toxic Content in Online Communities (\$100,000)

**Google Jigsaw Gift Award**, Annotating Community Moderation (\$125,000)

**Computing Innovation Postdoctoral Fellow 2020–2023**, Computing Research Association (CRA) and National Science Foundation fellowship awarded to study nascent challenges in online hate and harassment. (\$225,000)

**Magic Grant 2022–2023**, Awarded a grant by The David and Helen Gurley Brown Institute for Media Innovation for research in online hate and harassment. (\$107,580)

## Advising & Mentoring

*Undergraduate, Masters, and PhD students I have mentored/collaborated with*

2023: Yousef AbuHashem

2022: Elisa Tsai, Lauren Saue-Fletcher, Jaylene Martinez, Britney Tran, Amrita Palaparthi, Blain Engeda, Joyce Lu, Jinyoung Kim

2021: Catherine Han, Hans Hanley, Kimberly Ruth, Rishabh Chhabra, Oumnia Chellah, Sanjaye Narayan

2020: Muskan Shafat, Brandon Wang

2019: Rohan Subramanian, Meishan Wu, Eric Hennenfent

2018: Yi Zhou

2017: Zhengping Wang, Gabrielle Beck

### *Doctoral Committees*

Bruno Coelho (Ph.D., Computer Science & Engineering, NYU, Expected 2025)

## Invited Talks

16. **Understanding and Mitigating Online Abuse**, University of Wisconsin, Madison. Security Seminar. Dec 2023.
15. **Understanding and Mitigating Online Abuse**, University of California, San Diego Invited Colloquia. May 2023.
14. **Understanding and Mitigating Online Abuse**, University of North Carolina Chapel-Hill Invited Colloquia. March 2023.
13. **Understanding and Mitigating Online Abuse**, New York University Invited Colloquia. March 2023.
12. **Understanding Accounts That Engage in Hate and Harassment on Reddit**, ACM WebConf. May 2023.
11. **Understanding Accounts That Engage in Hate and Harassment on Reddit**, Stanford SIO Trust and Safety Research Conference. September 2022.
10. **Understanding Accounts That Engage in Hate and Harassment on Reddit**, Stanford Computer Forum. March 2022.
9. **Understanding Hate and Harassment as a Security Problem**, Stanford Security Lunch. February 2022.
8. **Understanding Hate and Harassment as a Security Problem**, Stanford Cyberfest. Virtual. October 2021.
7. **Let's Talk about Technology**, Chicago Teen Mentor's STEM Technology Day. Virtual. September 2021.
6. **Designing Toxic Content Classification for a Diversity of Perspectives**, USENIX Symposium on Usable Security and Privacy (SOUPS '21). Virtual. August 2021.
5. **SoK: Hate, Harassment, and the Changing Landscape of Online Abuse**, IEEE Symposium on Security and Privacy (Oakland). Virtual. May 2021.
4. **All Things Considered: An Analysis of IoT Devices on Home Networks**, USENIX Security Symposium. Santa Clara, CA. Aug 2019.
3. **Skill Squatting Attacks on Amazon Alexa**, USENIX Security Symposium. Baltimore, Maryland. Aug 2018.
2. **Tracking Certificate Misissuance in the Wild**, IEEE Symposium on Security and Privacy (Oakland). San Francisco, CA. May 2018.
1. **Security Challenges in an Increasingly Tangled Web**, World Wide Web Conference (WebConf). Perth, Australia. April 2017.

## Industry Experience

**Software Engineering Research Intern**, Google. May 2018 – Aug 2018.

**Software Engineering Intern**, Microsoft. May 2016–August 2016.

**Software Engineering Intern**, Microsoft. May 2015–August 2015.

**hackNY Fellow**, hackNY. May 2014–August 2014.

## References

1. Michael Bailey, Chair of the School of Cybersecurity and Privacy (SCP), Georgia Institute of Technology
2. Zakir Durumeric, Assistant Professor of Computer Science, Stanford University
3. Jeff Hancock, Professor of Communication, Stanford University
4. Roya Ensafi, Assistant Professor of Computer Science & Engineering, University of Michigan

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