Deepak Kumar

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Research Interests

My research focuses on computer security & privacy behaviors on the Internet. In particular, I am interested in issues of online abuse (e.g., hate and harassment, mis/disinformation, digital safety). My current research focuses on measuring abusive behaviors online and designing tools to help Internet users protect themselves from unwanted abusive behavior.

Education and Training

Postdoctoral researcher, Stanford University, 2020—2023. Building tools to measure and mitigate the effects of online abuse.
PI: Zakir Durumeric

Ph.D. Computer Science, University of Illinois, Urbana-Champaign, August 2020.
Advisor: Michael Bailey

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

Conference Publications

15. **Happenstance: Utilizing Semantic Search to Track Russian State Media Narratives about the Russo-Ukrainian War On Reddit** Hans Hanley, Deepak Kumar, Zakir Durumeric
To Appear: In International Conference on Web and Social Media (ICWSM), June 2023.

14. **"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
To Appear: In International Conference on Web and Social Media (ICWSM), June 2023.

13. **On the Infrastructure Providers that Support Misinformation Websites** Catherine Han, Deepak Kumar, Zakir Durumeric
In 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
In 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
In 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
In 17th 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 Burszstein, Dan Boneh, Sunny Consolvo, Nicki Dell, Zakir Durumeric, Patrick Gage Kelley, Deepak Kumar, Damon McCoy, Sarah Meiklejohn, Thomas Ristenpart, Gianluca Stringhini
   In 42nd 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
   In 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
   In 28th 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
   In 27th 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
   In 27th 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
   In 39th 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.
   In 39th 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.
   In 26th 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.
   In 26th World Wide Web Conference (WWW'17). Perth, Australia. April 3 - 7, 2017.

In Submission

1. **Understanding Longitudinal Behaviors of Toxic Accounts on Reddit**

2. **A Golden Age: Conspiracy Theories' Relationship with Misinformation Outlets, News Media, and the Wider Internet**

3. **Toppling Top Lists: Evaluating the Accuracy of Popular Website Lists**

4. **Understanding the Twitch Hate Raids of 2021**

Journal Publications

1. **Emerging Threats in IoT Voice Services** <u>Deepak Kumar</u>, Riccardo Paccagnella, Paul Murley, Eric Hennenfent, Joshua Mason, Adam Bates, and Michael Bailey
   In IEEE Security & Privacy Magazine. July 9, 2019.

External Service

Web Chair. 16th International Conference on Web and Social Media.

Program Committee. 31st USENIX Security Symposium.

Program Committee. 30th USENIX Security Symposium.

Invited Talks

9. **Understanding Accounts That Engage in Hate and Harassment on Reddit**, Stanford Computer Forum. March 2022.

8. **Examining Hate and Harassment as a Security Problem**, Stanford Security Lunch. February 2022.

7. **Examining Hate and Harassment as a Security Problem**, Stanford Cyberfest. Virtual. October 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 '21). 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 '18). San Francisco, CA. May 2018.

1. **Security Challenges in an Increasingly Tangled Web.**, World Wide Web Conference (WWW'17). Perth, Australia. April 2017.

Professional Experience

Postdoctoral Scholar, Stanford University. September 2020 – Present.

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

Research Assistant, University of Illinois, Urbana-Champaign. May 2017 – August 2020.
Advisor: Michael Bailey

Graduate Teaching Assistant, CS 461, University of Illinois, Urbana-Champaign. January 2017 – May 2017.

Research Assistant, University of Illinois, Urbana-Champaign. August 2016 – December 2016.
Advisor: Michael Bailey

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

Teaching Assistant, EECS 388, University of Michigan. August 2015–May 2016.

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

hackNY Fellow, hackNY. May 2014–August 2014.

Honors and Awards

Computing Innovation Postdoctoral Fellow 2020–2022, Computing Research Association (CRA) and National Science Foundation fellowship awarded to study nascent challenges in online hate and harassment.

Brown Institute Magic Grant Awardee 2022–2023, Awarded a grant for research in online hate and harassment.

Volunteering and Mentorship

PhD Student Mentor, Stanford University. 2020–2022.

CURIS Undergraduate Mentor, Stanford University. Summer 2021, Summer 2022.

Master's Student Mentor, University of Illinois, Urbana-Champaign. Summer 2017.

ICOS Big Data BootCamp, Ann Arbor, Michigan. June 2016.

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