

Rahul Chatterjee

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CURRENT POSITION	Assistant Professor Computer Sciences, University of Wisconsin–Madison	Madison, WI August 2019 - Now
RESEARCH INTERESTS	Computer security and privacy: Designing systems that are safe, secure, and human friendly. Interests include authentication, digital safety of vulnerable populations, applied cryptography, and privacy.	
EDUCATION	Cornell University PhD, Computer Science Advisor: Thomas Ristenpart Thesis: “Next Generation Password-Based Authentication Systems” University of Wisconsin–Madison Masters, Computer Sciences Indian Institute of Technology, Kharagpur Bachelor of Technology, Computer Science and Engineering	Ithaca, NY August 2015 - August 2019 Madison, WI August 2013 - May 2015 Kharagpur, West Bengal July 2008 - June 2012
PUBLICATIONS	<ol style="list-style-type: none">[1] Majed Almansoori, Mazharul Islam, Saptarshi Ghosh, Mainack Mondal, <u>Rahul Chatterjee</u>, “The Web of Abuse: Online Resource Asymmetry in Intimate Partner Violence,” <i>Euro S&P</i>, 2024.[2] Mazharul Islam, Sunpreet S. Arora, <u>Rahul Chatterjee</u>, Peter Rindal, Maliheh Shirvanian, “Compact: Approximating Complex Activation Functions for Secure Computation,” <i>PoPETS</i>, 2024.[3] Asmita Pal, Keerthana Desai, <u>Rahul Chatterjee</u>, Joshua San Miguel, “Camouflage: Utility-Aware Obfuscation for Accurate Simulation of Sensitive Program Traces,” <i>Transaction on Code and Architecture Optimization</i>, 2024.[4] Sophie Stephenson, Majed Almansoori, Pardis Emami-Naeini, <u>Rahul Chatterjee</u>, ““It’s the Equivalent of Feeling Like You’re in Jail”: Lessons from Firsthand and Secondhand Accounts of IoT-Enabled Intimate Partner Abuse,” <i>USENIX Security Symposium</i>, 2023. (Acceptance rate: 22.0%)[5] Rose Ceccio, Sophie Stephenson, Danny Yuxing Huang, <u>Rahul Chatterjee</u>, “Sneaky Spy Devices and Defective Detectors: The Ecosystem of Intimate Partner Surveillance,” <i>USENIX Security Symposium</i>, 2023. (Acceptance rate: 22.0%)[6] Sophie Stephenson, Majed Almansoori, Pardis Emami-Naeini, Danny Yuxing Huang, <u>Rahul Chatterjee</u>, “Abuse Vectors: A Framework for Conceptualizing IoT-Enabled Interpersonal Abuse,” <i>USENIX Security Symposium</i>, 2023. (Acceptance rate: 8.0%)[7] Avirup Mukherjee, Kousshik Murali, Shivam K Jha, Niloy Ganguly, <u>Rahul Chatterjee</u>, Mainack Mondal, “MASCARA: Systematically Generating Memorable And Secure Passphrases,” <i>ASIA CCS</i>, 2023. (Acceptance rate: 21.6%)[8] Mazharul Islam*, Marina Sanusi-Bohuk*, Paul Chung, Thomas Ristenpart, <u>Rahul Chatterjee</u>, “Araña: Discovering and Characterizing Password Guessing Attacks in Practice,” <i>USENIX Security Symposium</i>, 2023. (Acceptance rate: 16.0%)[9] Majed Almansoori, Jessica Lam, Elias Fang, Adalbert Gerald Soosai Raj, <u>Rahul Chatterjee</u>, “Towards Finding the Missing Pieces to Instill Security Mindset in Students,” <i>ACM SIGCSE Technical Symposium</i>, 2023.[10] Yunang Chen, Yue Gao, Rose Ceccio, <u>Rahul Chatterjee</u>, Kassem Fawaz, and Earlence Fernandes, “Analyzing the Security of the Business Collaboration Platform App Model,” <i>USENIX Security Symposium</i>, 2022. (Acceptance rate: 7.0%)[11] Majed Almansoori, Andrea Gallardo, Julio Poveda, Adil Ahmed, and <u>Rahul Chatterjee</u>, “A Global Survey of Android Dual-Use Applications Used in Intimate Partner Surveillance,” <i>PoPETS</i>, 2022. (Acceptance rate: 22.0%)[12] Marina Sanusi-Bouhk, Mazharul Islam, Suleman Ahmad, Mike Swift, Thomas Ristenpart, <u>Rahul Chatterjee</u>, “Gossamer: Securely Measuring Password-based Logins,” <i>USENIX Security Symposium</i>, 2022. (Acceptance rate: 7.0%)[13] Sophie Stephenson, Bijeeta Pal, Stephen Fan, Earlence Fernandes, Yuhang Zhao, <u>Rahul Chatterjee</u>, “SoK: Authentication in Augmented and Virtual Reality,” <i>IEEE Symposium on Security and</i>	

- Privacy (S&P, Oakland), 2022.* (Acceptance rate: 13.0%)
- [14] Bijeeta Pal, Mazharul Islam, Marina Sanusi-Bohuk, Luke Valenta, Tara Whalen, Nick Sullivan, Thomas Ristenpart, Rahul Chatterjee, “*Might I Get Pwned: A Second Generation Password Breach Alerting Service,*” *USENIX Security Symposium, 2022.* (Acceptance rate: 17.0%)
- [15] Jessica Lam, Elias Fang, Majed Almansoori, Rahul Chatterjee, and Adalbert Gerald Soosai Raj, “*Identifying Gaps in the Secure Programming Knowledge and Skills of Students,*” *ACM SIGCSE Technical Symposium, 2022.* (Acceptance rate: 20.0%)
- [16] Yunang Chen, Mohannad Alhanahnah, Andrei Sabelfeld, Rahul Chatterjee, Earlence Fernandes, “*Practical Data Access Minimization in Trigger-Action Platforms,*” *USENIX Security Symposium, 2022.* (Acceptance rate: 18.0%)
- [17] Athena Sayles, Ashish Hooda, Mohit Gupta, Rahul Chatterjee, Earlence Fernandes, “*Invisible Perturbations: Physical Adversarial Examples Exploiting the Rolling Shutter Effect,*” *CVPR, 2021.* (Acceptance rate: 20.0%)
- [18] Yunang Chen, Amrita R. Chowdhury, Ruizhe Wang, Andrei Sabelfeld, Rahul Chatterjee, Earlence Fernandes, “*Data Privacy in Trigger-Action Systems,*” *IEEE Symposium on Security and Privacy (S&P, Oakland), 2021.* (Acceptance rate: 11.0%)
- [19] Majed Almansoori, Jessica Lam, Elias Fang, Adalbert Gerald Soosai Raj, Rahul Chatterjee, “*Textbook Underflow: Insufficient Security Discussions in Textbooks Used for Computer Systems Courses,*” *ACM SIGCSE Technical Symposium, 2021.* (Acceptance rate: 21.0%)
- [20] Neal Pongmorakot, Rahul Chatterjee, “*tPAKE: Typo-Tolerant Password-Authenticated Key Exchange,*” *SPACE, 2020.* (Acceptance rate: 20.0%)
- [21] Majed Almansoori, Jessica Lam, Elias Fang, Adalbert Gerald Soosai Raj, and Rahul Chatterjee, “*How Secure are our Computer Systems Courses?,*” *ACM ICER, 2020.* (Acceptance rate: 24.0%)
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- [22] Rahul Chatterjee, M. Sadegh Riazi, Tanmoy Chowdhury, Emanuela Marasco, Farinaz Koushanfar, Ari Juels, “*Multisketches: Practical Secure Sketches Using Off-the-Shelf Biometric Matching Algorithms,*” *ACM CCS, 2019.* (Acceptance rate: 17.0%)
- [23] Lucy Li, Bijeeta Pal, Junade Ali, Nick Sullivan, Rahul Chatterjee, Thomas Ristenpart, “*Protocols for Checking Compromised Credentials,*” *ACM CCS, 2019.* (Acceptance rate: 17.0%)
- [24] Diana Freed, Sam Havron, Emily Tseng, Andrea Gallardo, Rahul Chatterjee, Thomas Ristenpart, Nicola Dell, “*“Is my phone hacked?” Analyzing Clinical Computer Security Interventions with Survivors of Intimate Partner Violence,*” *ACM CSCW, 2019.* (Acceptance rate: 31.0%) **Honorable Mention for Best Paper Award**
- [25] Sam Havron, Diana Freed, Rahul Chatterjee, Damon McCoy, Nicola Dell, Thomas Ristenpart, “*Clinical Computer Security for Victims of Intimate Partner Violence,*” *USENIX Security Symposium, 2019.* (Acceptance rate: 16.0%)
- [26] Bijeeta Pal, Tal Daniel, Rahul Chatterjee, Thomas Ristenpart, “*Beyond Credential Stuffing: Password Similarity Models using Neural Networks,*” *IEEE Symposium on Security and Privacy (S&P, Oakland), 2019.* (Acceptance rate: 12.0%)
- [27] Rahul Chatterjee, Periwinkle Doerfler, Hadas Orgad, Sam Havron, Jackeline Palmer, Diana Freed, Karen Levy, Nicola Dell, Damon McCoy, Thomas Ristenpart, “*The Spyware Used in Intimate Partner Violence,*” *IEEE Symposium on Security and Privacy (S&P, Oakland), 2018.* (Acceptance rate: 11.0%)
- [28] Rahul Chatterjee, Joanne Woodage, Yual Pnueli, Anusha Chowdhury, Thomas Ristenpart, “*The TypTop System: Personalized Typo-Tolerant Password Checking,*” *ACM CCS, 2017.* (Acceptance rate: 18.0%)
- [29] Joanne Woodage, Rahul Chatterjee, Yevgeniy Dodis, Ari Juels, Thomas Ristenpart, “*A New Distribution-Sensitive Secure Sketch and Popularity-Proportional Hashing,*” *Crypto, 2017.* (Acceptance rate: 23.0%)
- [30] Rahul Chatterjee, Anish Athalye, Devdatta Akhawe, Ari Juels, Thomas Ristenpart, “*pPASSWORD tYPOS and How to Correct Them Securely,*” *IEEE Symposium on Security and Privacy (S&P, Oakland), 2016.* (Acceptance rate: 13.0%) **Distinguished Student Paper Award**
- [31] Adam Everspaugh, Rahul Chatterjee, Samuel Scott, Ari Juels, Thomas Ristenpart, “*The Pythia PRF Service,*” *USENIX Security Symposium, 2015.* (Acceptance rate: 16.0%)

[32] Rahul Chatterjee, Joseph Bonneau, Ari Juels, Thomas Ristenpart, “Cracking-Resistant Password Vaults using Natural Language Encoders,” *IEEE Symposium on Security and Privacy (S&P, Oakland)*, 2015. (Acceptance rate: 13.0%)

PATENTS [33] Yunang Chen, Mohannad Alhanahnah, Andrei Sabelfeld, Rahul Chatterjee, Earlence Fernandes, “Method and Apparatus for Improved Security in Trigger Action Platforms”, US Patent App. 17/339,273, 2022

[34] Varun Chandrasekaran, Rahul Chatterjee, Xiaohan Fu, Jin-Yi Cai, Suman Banerjee, “Method and Apparatus using Blended Biometric Data”, US Patent App. 17/177,080, 2022

GRANTS 2023

- **(Awarded)** Fall Research Competition 2023, “Framework to Combat against Covert Surveillance Devices,” PI: Rahul Chatterjee, \$49,098.
- **(Awarded)** NSF CAREER Award 2023, “Account Security Against Interpersonal Attacks,” PI: Rahul Chatterjee, \$686,386.
- **(Awarded)** NIJ/Office for Victims of Crime, “Remote Tech Clinic to Combat Tech-Enabled Domestic Abuse in Rural Wisconsin,” PI: Rahul Chatterjee, Co-PI: Kate Walsh, \$691,062 (my portion).

STUDENT Ph.D. Students

ADVISEES

- Naman Gupta (Sp '23 -)
- Michelle Jensen (Co-advised with Matthew Berland, Fa '22 -)
- Rose Ceccio (Su '22 -)
- Sophie Stephenson (Sp '22 -)
- Mazharul Islam (Fa '21 -)
- Majed Almansoori (Fa '20 -)
- Dr. Yunang Chen (Co-advised with Earlence Fernandes, Sp '20 - Fa '23, → first position Google)

In Doctoral Thesis Committee se

- Anjali . (CS, UW-Madison)
- Max Zinkus (CS, Univ. of Maryland)
- Asmita Pal (ECE, UW-Madison)
- Ryan Sheatsley (CS, UW-Madison)
- Eric Pauley (CS, UW-Madison)
- Rishabh Khandelwal (ECE, UW-Madison,)
- Yue Gao (CS, UW-Madison)
- Jingjie Li (ECE, UW-Madison, 2023, → first position Asst. Prof. at Univ. of Edinburgh)
- Kyuin Lee (ECE, UW-Madison, 2022, → first position Asst. Prof. at Univ of Houston)

Masters Students

- Aditya Das Sarma (Sp '24 -)
- Akhil Polamarasetty (Fa '22 - Fa '23, → PhD student at UCL)
- Adil Ahmed (Su '21 - Fa '23, → first position Figma)
- Suleman Ahmad (Fa '20 - Sp '21, → first position Cloudflare)
- Deepak Srinath (Fa '20 - Sp '21, → first position Sigma Computing)

Undergraduate students

- Michael Noguera (Sp '23 - Su '24)
- Yiwei Chen (Sp '23 -)
- Paul Chug (Sp '22 -)
- Ruizhe Wang (Fa '20 - Sp '21 → MMath student at Univ. of Waterloo)
- Neal Pongmorrakot (Fa '20 - Sp '21)
- Katy Dong (Fa '20 - sp21, → MS at CMU)
- Yukun Li (Fa '20 - sp21, → MS at CMU)
- Quinn Cassidy (Su '21)

Closely advised students in other universities

- Xiaohan Fu (PhD, UCSD, Su '20 -)
- Marina Sanusi (PhD, Cornell, Fa '19 -)
- Bijeeta Pal (PhD, Cornell, Fa '18 - Su '22, → first position SnapChat)

POSITIONS	Assistant Professor University of Wisconsin–Madison	Fa '19 - present Madison, WI
	Graduate research assistant Cornell University	Fa '15 - Sp '19 New York, USA
	Research Intern. Dropbox	Su '16 San Francisco, USA
	Research Intern Microsoft Research Technologies	Su '15 Redmond, USA
	Graduate research assistant University of Wisconsin-Madison	Fa '13 - Sp '15 Madison, USA
	Software developer and quantitative analyst Two Roads Technological Solutions Pvt. Ltd.	Su '12 - Sp '13 Bangalore, India
	Undergraduate research assistant Indian Institute of Technology, Kharagpur	Fa '10 - Sp '12 Kharagpur, India

TEACHING	Instructor
	<ul style="list-style-type: none">• CS 642: Introduction to Information Security · Fa '19, Fa '20, Fa '21, Fa '22, Sp '23• CS 839: Advanced topics in Computer Security and Privacy · Sp '20, Sp '21• CS 782: Advanced Computer Security and Privacy · Fa '22, Sp '24,

SERVICES	Program Committee
	<ul style="list-style-type: none">• IEEE S&P '20, '21, '24• USENIX Security '21, '22, '23, '24• ACM CCS '21, '23• PoPETS '22, '23, '24,• Workshops: WAY '19, '20, '21; EuroUSEC '20, '21, '22, '23; SafeThings '21, '22; SecHOPE '23• Other conferences: SAPCE '20; CHI '19, '23; Journal of Crypto '19; Violence Against Women 20, 21, 22
	Program Committee Chair
	<ul style="list-style-type: none">• HCIC 2023
	Internal Committees
	<ul style="list-style-type: none">• In Graduate Admission Committee '20, '21, '22, '23, '24• In Professional Masters Admission Committee '22, '24• In Computing Ethics Cluster Hire Committee '23-24• Host of Computer Science Distinguished Lecture Series '23-24
	Grant/Fellowship reviewing
	<ul style="list-style-type: none">• NSF Reviewer (multiple panels) '24• Invited to SaTC 2.0 workshop to outline the vision for NSF SaTC for the next decade. '23

INVITED TALKS	<ul style="list-style-type: none">• <i>CyLab</i>, CMU Invited Speaker, “Privacy and Safety Issues of Smart Home Devices”, Feb 19, 2024• <i>Workshop on Inclusive Privacy and Security (WIPS)</i>, <i>SOUPS 2023</i>, Keynote Speaker, “Security and Privacy Research with Vulnerable Populations,” July 30, 2023• <i>Research Bazaar</i>, <i>UW-Madison</i>, Panel on Privacy & Security of Data Collection and Preservation, Feb 23, 2023• <i>Marquette University</i>, Panel on Privacy & Security Challenges Around Smart Devices, Jan 28, 2023
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- *UKSW, Indonesia*, “Research Trends in Computer Security and Privacy,” Jul 28, 2022
- *Chalmers Invited Talks*, “Perils of Leaked Passwords and How to Protect against Them,” Nov 2021
- *Google MSN Talks*, “Perils of Leaked Passwords and How to Protect against Them,” Apr 2021
- *Dane County Commission on Sensitive Crimes, Madison*, “Intimate Partner Surveillance,” Jan 2021
- *LUCID talks, UW–Madison*, “Intimate Partner Surveillance,” Nov 2020
- *SIL0, UW–Madison*, “The Perils of Leaked Passwords and How to Protect from Those,” Feb 2020
- *IIT Kharagpur*, “The Spyware Used in Intimate Partner Violence and How to Stop Them,” Jan 2020
- *University of Waterloo*, “Empiricism-Informed Secure System Design: From Improving Passwords to Helping Domestic Violence Victims.,” Apr 2019
- *UW–Madison*, “Empiricism-Informed Secure System Design: From Improving Passwords to Helping Domestic Violence Victims.,” Mar 2019
- *IMDEA Software Institute*, “Empiricism-Informed Secure System Design: From Improving Passwords to Helping Domestic Violence Victims.,” Mar 2019
- *ETH*, “Empiricism-Informed Secure System Design: From Improving Passwords to Helping Domestic Violence Victims.,” Mar 2019
- *Georgetown University*, “Empiricism-Informed Secure System Design: From Improving Passwords to Helping Domestic Violence Victims.,” Mar 2019
- *Penn State University*, “Empiricism-Informed Secure System Design: From Improving Passwords to Helping Domestic Violence Victims.,” Mar 2019
- *USC*, “Empiricism-Informed Secure System Design: From Improving Passwords to Helping Domestic Violence Victims.,” Mar 2019
- *Oregon State University*, “Empiricism-Informed Secure System Design: From Improving Passwords to Helping Domestic Violence Victims.,” Feb 2019
- *UCLA*, “Empiricism-Informed Secure System Design: From Improving Passwords to Helping Domestic Violence Victims.,” Feb 2019
- *CISPA Helmholtz Center*, “Empiricism-Informed Secure System Design: From Improving Passwords to Helping Domestic Violence Victims.,” Feb 2018
- *Cyber Sexual Abuse Task Force*, “The Spyware Used in Intimate Partner Violence,” June 2018
- *IIT Kharagpur*, “Next-Gen Passwords,” January 2018
- *NSF Cybersecurity TTP Workshop*, “Improving Security by Tolerating Password Typos,” April 2017
- *Dropbox*, “pASSWORD tYPOS and How to Correct Them Securely,” July 2016

IMPACT

- Established *Madison Tech Clinic* in collaboration with Domestic Abuse Intervention Services (DAIS) to help survivors of domestic violence combat digital abuse.
- MIGP is deployed by Cloudflare <https://migp.cloudflare.com> [14].
- Identified hundreds of compromised accounts at UW-Madison and Cornell, notified respective authorities [8].
- Improved security of vulnerable Cornell accounts identified in [26].
- Build tools and worked as tech consultant to help survivors of intimate partner violence in New York City [25].
- Based on our study [27], Google stopped serving advertisements on search terms relating to intimate partner violence and increased enforcement of Play Store policies.
- Pythia [31] is being used in industry for hardening passwords.

SELECTED MEDIA COVERAGE

- Full list is available at: <https://pages.cs.wisc.edu/~chatterjee>.
- “Experimental Security Analysis of the App Model in Business Collaboration Platforms,” *USENIX ;login:* (October 23, 2022)
 - “The Sticky Problem of Measuring Passwords,” *USENIX ;login:* (October 4, 2022)
 - “NYC has hired hackers to hit back at stalkerware,” *MIT Technology Review* (August 14, 2019)
 - “New tools help detect digital domestic abuse,” *Cornell Chronicle* (August 13, 2019)
 - “How ‘stalkerware’ apps are letting abusive partners spy on their victims,” *MIT Technology Review*

(July 10, 2019)

- “The simple way Apple and Google let domestic abusers stalk victims,” *WIRED* (July 2, 2019)
- “Study finds hundreds of stalker apps, few ways of finding them on your phone,” *Global News* (June 13, 2019)
- “Hundreds of apps can empower stalkers to track their victims,” *The New York Times* (May 19, 2018)
- “Why autocorrect for passwords is a great idea,” *MIT Tech Review* (June 1, 2016)
- “NoCrack: Protect passwords with fake ones?,” *SSL.com* (June 3, 2015)

ACADEMIC	• NSF CAREER ward.	2023
ACHIEVEMENTS,	• Facebook research award.	2021
AWARDS, AND	• Honorable Mention for Best Paper award for [24] at ACM CSCW.	2019
SCHOLARSHIPS	• Distinguished student paper award for [30] at IEEE S&P.	2016
	• Received <i>special CS fellowship</i> from UW–Madison.	2013
	• Secured 4 th rank ACM-ICPC regional contest North Central region.	2013
	• Selected for Indian National Mathematics Olympiad (INMO) in 2007.	