MAZHARUL ISLAM

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RESEARCH INTERESTS

Topics	User authentication, online abuse detection and prevention, privacy enchancing techniques
Areas	Cryptography, machine learning, empirical analysis.

EDUCATION

University of Wisconsin–Madison *Madison, WI*
Ph.D. student in Computer Science, Advisor: Prof. Rahul Chatterjee. 2020 - Present
- M.Sc. in Computer Science, CGPA: 3.75/4.00 2020 - 2022

Bangladesh University of Engineering & Technology (BUET) *Dhaka, Bangladesh*
- B.Sc. in Computer Science and Engineering, CGPA: 3.73/4.00 2012 - 2017

WORK EXPERIENCES

University of Wisconsin-Madison *Madison, WI*
- Graduate Research Assistant, Research Lab: MadS&P Aug 2020 - Present
- Projects: Working on enhancing security of password based user authentication using techniques from applied cryptography and machine learning. Supervisor: Prof. R. Chatterjee

Visa Research *Palo Alto, CA*
- Ph.D. Research Intern, Systems security team May 2023 - Aug 2023
- Project: Account recovery problem in passworldless user authentication. Supervisor: Sunpreet S. Arora

Visa Research *Palo Alto, CA*
- Ph.D. Research Intern, Systems security team May 2022 - Aug 2022
- Project: Designing multi-party computation (MPC) friendly complex non-linear functions used in deep neural networks. Supervisor: Sunpreet S. Arora

University of Wisconsin-Madison *Madison, WI*
- Graduate Teaching Assistant, CS 642-Introduction to Information Security Aug 2020 - Dec 2020
- I conducted office hours, prepared and graded homeworks for a class of more than 90 students.

United International University *Dhaka, Bangladesh*
- Lecturer, Department of Computer Science Jul. 2017 - Jul. 2019
- I was the primary instructor for two undergraduate-level courses CSE-477: Network Security and CSE-315: Data communications for more than 300 students throughout six semesters.

iPay Systems Ltd *Dhaka, Bangladesh*
- Software Engineer, Front-end developer May 2017 - Jul. 2017
- I developed a firewall manager from scratch on top of a Linux program named `iptables` using AngularJS and Django backend that can help the network administrators to navigate and manage firewall rules with ease.

RESEARCH IMPACT

- Might I Get Pwned (MIGP) [3] is deployed at Cloudflare (a major CDN provider) to warn users from selecting passwords similar (and same) to a breached password in a secure way (official blog link)
- My proposed changes of Spring security framework in [4] have improved its documentation (Link) and contributed a new fix (Link) on 6.0.x release.

SELECTED PUBLICATIONS (FULL LIST OF PUBLICATIONS ARE HERE)

1. **Mazharul Islam***, Marina Sanusi Bohuk*, Paul Chung, Thomas Ristenpart, Rahul Chatterjee (*co-first authors). *"Araña: Discovering and Characterizing Password Guessing Attacks in Practice"*, 32nd USENIX Security 2023, Anaheim, CA (To appear). [Acceptance rate: TBD%], [PDF][Source Code]

2. Marina Sanusi Bohuk, **Mazharul Islam**, Suleman Ahmad, Michael Swift, Thomas Ristenpart, Rahul Chatterjee *"Gossamer: Securely Measuring Password-based Logins"*, 31st USENIX Security 2022, Boston, MA [Acceptance rate: 17.2%] [PDF] [Source Code] [Media Coverage]

3. Bijeeta Pal, **Mazharul Islam**, Marina Sanusi Bohuk, Nick Sullivan, Luke Valenta, Tara Whalen, Christopher Wood, Thomas Ristenpart, Rahul Chattejee. *"Might I Get Pwned: A Second Generation Compromised Credential Checking Service"*, 31st USENIX Security 2022, Boston, MA. [Acceptance rate: 17.2%] [PDF] [Source code][Media Coverage]

4. **Mazharul Islam**, Sazzadur Rahaman, Na Meng, Behnaz Hassanshahi, Padmanabhan Krishnan, Danfeng Yao. *"Coding Practices and Recommendations of Spring Security for Enterprise Applications"*, IEEE-SecDev 2020. [Acceptance rate = 39%] [PDF] [Presentation Video]

5. **Mazharul Islam**, Novia Nurain , Mohammad Kaykobad , Sriram Chellappan , A. B. M. Alim Al Islam. *"HEliOS: Huffman Coding Based Lightweight Encryption Scheme for Data Transmission"*, 16th MobiQuitous 2019, Houston, TX. [h-index 40, Acceptance rate: 30%] [PDF].

6. **Mazharul Islam**, Kowshika Sarker, Trisha Das, Rezwana Reaz, Md. Shamsuzzoha Bayzid. *"STELAR: A statistically consistent coalescent-based species tree estimation method by maximizing triplet consistency"*, BMC Genomics **21**, 136 (2020). [Impact factor: 3.9] [PDF] [Source Code]

7. Sumit Tarafder, **Mazharul Islam**, Swakkhar Shatabda, Atif Rahman. *"Figbird: A probabilistic method for filling gaps in genome assemblies"*, Bioinformatics, Volume 38, Issue 15. [Impact factor: 6.9] [PDF] [Source code]

8. **Mazharul Islam**, Sunpreet S. Arora, Rahul Chatterjee, Peter Rindal, Maliheh Shirvanian. *"Approximating Complex Neural Network Activation Functions for Secure Computation"* [Under Submission][PDF available on request] [Provisional patent filed]

AWARDS

- Travel Grants: Privacy Preserving Machnine Learning (PPML), 2022
- CS Fellowship: Given to $15-20\%$ top admitting graduate students at UW-Madison, 2020
- Best Poster: NSysS conference, 2015
- Programming Contest: ACM-ICPC Dhaka regional, Bangladesh 17th/170 teams.
- Academic Excellence: Dean List Awards & University Merit List Scholarship for Academic Result, BUET.

SKILLS

Languages	Python, C++, Java, Go, HTML, CSS
Frameworks	Pytorch, Django, AngularJS, EMPToolkit
Tools	Git, Docker

SOFTWARE ARTIFACTS

- MIGP (Might I Get Pwned): A next-generation password breach altering service. (GitHub Link)

- Araña: A tool for identifying high and low volume attack campaigns from login logs (GitHub Link)
- STELAR: A dynamic programming (DP) based software to estimate species tree by maximizing triplet agreement. (GitHub Link)
- Mock search engine: A mock search engine that takes the users' search queries and fetches the HTML from Google server. The interaction of the user with the server is recorded and saved into a SQLite3 database. (GitHub Link).

EXTRA CURRICULAR ACTIVITIES

Reviewer	• Artifact evaluation PC member USENIX 2022 (2), Externally reviewed papers from USENIX 2022 (1), IEEE S&P 2023 (1)
Social Work	• Worked as field volunteer and took sessions on improving health hygiene and mental development of the children of sex-workers at nonprofit organization named Project Pothchola (2017). • Volunteering in "Madison Tech Clinic" as part of "Domestic Abuse Intervention Services (DAIS)" at Madison to provide consultation to victims of tech-enabled intimate partner violence (2022 - 2023)