

# MAZHARUL ISLAM

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## RESEARCH INTERESTS

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

## EDUCATION

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### 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

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### 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 passwordless 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*”, 32<sup>nd</sup> 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*”, 31<sup>st</sup> USENIX Security 2022, Boston, MA [[Acceptance rate: 17.2%](#)] [[PDF](#)] [[Source Code](#)] [[Media Coverage](#)]
3. Bijeta Pal, **Mazharul Islam**, Marina Sanusi Bohuk, Nick Sullivan, Luke Valenta, Tara Whalen, Christopher Wood, Thomas Ristenpart, Rahul Chatterjee. “*Might I Get Pwned: A Second Generation Compromised Credential Checking Service*”, 31<sup>st</sup> 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*”, 16<sup>th</sup> 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 Machine 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 17<sup>th</sup>/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, EMPTToolkit
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 Software to Estimate Species Tree by maximizing triplet agreement. ([GitHub Link](#))
- *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

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Reviewer	<ul style="list-style-type: none"> <li>• <a href="#">Artifact evaluation PC member USENIX 2022</a> (2), Externally reviewed papers from USENIX 2022 (1), IEEE S&amp;P 2023 (1)</li> </ul>
Social Work	<ul style="list-style-type: none"> <li>• Worked as field volunteer and took sessions on improving health hygiene and mental development of the children of sex-workers at nonprofit organization named <a href="#">Project Pothchola</a> (2017).</li> <li>• Volunteering in “<a href="#">Madison Tech Clinic</a>” as part of “<a href="#">Domestic Abuse Intervention Services (DAIS)</a>” at Madison to provide consultation to victims of tech-enabled intimate partner violence (2022 - 2023)</li> </ul>