

# Faysal Hossain Shezan

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## APPOINTMENT

Assistant Professor in University of Texas at Arlington

August 2023 - present

## EDUCATION

PhD in Computer Science

August 2023

Topic: Cross-Platform Security and Privacy Analysis of Emerging Systems

Advisor: Dr. Yuan Tian

University of Virginia

Visiting Research Assistant

January 2023 - August 2023

Host: Dr. Yuan Tian

University of California, Los Angeles

Masters in Computer Science

August 2022

CGPA 4.00/4.00 (unofficial transcript)

University of Virginia

BSc in Computer Science and Engineering

March 2016

Thesis Title: High Performance Approximate Computing by Adaptive Relaxed Synchronization

Thesis Advisor: Dr. Rifat Shahriar

Bangladesh University of Engineering and Technology

## RESEARCH OVERVIEW

My research lies in the intersection of **security & privacy** with **cyber-physical systems**, **medical healthcare**, **software engineering**, and **machine learning**.

## PUBLICATIONS

- [SOUPS'23]: M. McCall, E. Zeng, **F. H. Shezan**, M. Yang, L. Bauer, A. Bichawat, C. Cobb, L. Jia, Y. Tian, "Security Analysis for Inter-Connected Platform". Symposium on Usable Privacy and Security 2023 [pdf]
- [PETS'23]: **F. H. Shezan**, M. Long, D. Hasani, G. Wang, Y. Tian, "SenRev: Measurement of Personal Information Disclosure in Online Health Communities", Proceedings of the Privacy Enhancing Technologies Symposium 2023 [pdf]
- [NDSS'23]: **F. H. Shezan**, Z. Su, M. Kang, N. Phair, P. W. Thomas, M.V. Dam, Y. Cao, Y. Tian, "CHKPLUG: Checking GDPR Compliance of WordPress Plugins via Cross-language Code Property Graph", In Network and Distributed Systems Security (NDSS) Symposium 2023 [pdf]
- [IEEE CNS'22]: **F. H. Shezan**, Y. Lao, M. Peng, X. Wang, M. Sun, P. Li, "NL2GDPR: Automatically Develop GDPR Compliant Android Application Features from Natural Language", IEEE Conference on Communications and Network Security (IEEE CNS 2022) [pdf]
- [IMWUT/UbiComp'21]: **F. H. Shezan**, H. Hu, G. Wang, Y. Tian, "VerHealth: Vetting Medical Voice Applications through Policy Enforcement", Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies 2021 [pdf]
- [WWW'20]: **F. H. Shezan**, H. Hu, J. Wang, G. Wang, Y. Tian, "Read Between the Lines: An Empirical Measurement of Sensitive Applications of Voice Personal Assistant Systems", Proceedings of the Web Conference 2020 [pdf]
- [NDSS'20]: **F. H. Shezan**, K. Cheng, Z. Zhang, Y. Cao, Y. Tian, "TKPERM: Cross-platform Permission Knowledge Transfer to Detect Overprivileged Third-party Applications", In Network and Distributed Systems Security (NDSS) Symposium 2020 [pdf]
- [IMWUT/UbiComp'20]: Y. Lee, Y. Zhao, J. Zeng, K. Lee, N. Zhang, **F. H. Shezan**, Y. Tian, K. Chen, X. Wang, "Using sonar for liveness detection to protect smart speakers against remote attackers", Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies 2020 [pdf]
- [NSysS'17]: **F. H. Shezan**, S. F. Afroze, A. Iqbal, "Vulnerability Detection in Recent Android Apps: An Empirical Study", Proceedings of International Conference on Networking, Systems and Security 2017 [pdf]
- [ITID'17]: I. Ahmed, S. Guha, M. R. Rifat, **F. H. Shezan**, N. Dell, "Privacy Vulnerabilities in the Practices of Repairing Broken Digital Artifacts in Bangladesh", Information Technologies and International Development 2017 [pdf] (*best of ICTD paper*)
- [HPCC'16]: B. Islam, **F. H. Shezan**, R. Shahriyar, "High Performance Approximate Computing by Adaptive Relaxed Synchronization", Proceedings of International Conference on High Performance Computing and Communications 2016 [pdf]
- [ICTD'16]: I. Ahmed, S. Guha, M. R. Rifat, **F. H. Shezan**, N. Dell, "Privacy in Repair: An Analysis of the Privacy Challenges Surrounding Broken Digital Artifacts in Bangladesh", Proceedings of International Conference on Information and Communication Technologies and Development 2016 [pdf]
- [IEEE WIECON-ECE'15]: S. S. Rahman, S.S. Nusaka, **F. H. Shezan**, M. A. R. Sarkar, "The Development of Low Cost Exercise Monitoring Device for Paralytic", IEEE International Women in Engineering (WIE) Conference on Electrical and Computer Engineering 2015 [pdf]

## WORKSHOP PAPERS

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- [SSPXR'22]: Z. Su, **F. H. Shezan**, Y. Tian, D. Evans and S. Heo, "Perception Hacking for 2D Cursorjacking in Virtual Reality", Proceedings of Safety, Security and Privacy in Extended Reality, Co-located with CHI 2022 [pdf]
- [MASSW'19]: Y. Yu, C. Li, M. A. Jonas, C. Ma, **F. H. Shezan**, S. Shen, P. Gao, Y. Tian "Detecting Abnormal Behaviors in Smart Home", International Conference on Mobile Ad Hoc and Sensor Systems Workshops 2019 [pdf]
- [SPW'19]: S. Liu, Y. Wei, J. Chi, **F. H. Shezan**, and Y. Tian, "Side Channel Attacks in Computation Offloading Systems with GPU Virtualization", IEEE Security and Privacy Workshops 2019, [pdf]

## POSTERS

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- [MobiSys'17]: "Poster: HeartFit: An Intuitive Smartphone Application for Well-being of Hypertensive Patients", S. F. Afroze, **F. H. Shezan**, and S. Sharmin, Proceedings of the annual international conference on mobile systems, applications, and services 2017 [pdf]

## GOOGLE SCHOLAR

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**h-index: 7, i10-index: 7**, citations: 203 (as of 9 Dec, 2023),

Link to Google Scholar- <https://scholar.google.com/citations?user=h2h3PMEAAAAJ&hl=en&oi=ao>

## ACCEPTED CVEs

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CVE-2021-41208 (Buffer Overflow, CWE-824, CVSS 9.3)  
CVE-2022-21736 (Buffer Overflow, CWE-476, CVSS 7.6)  
CVE-2022-21740 (Buffer Overflow, CWE-787, CVSS 7.6)  
CVE-2022-21735 (Divide By Zero, CWE-369, CVSS 6.5)  
CVE-2022-23567 (Integer Overflow, CWE-190, CVSS 6.5)  
CVE-2022-21739 (Buffer Overflow, CWE-476, CVSS 6.5)  
CVE-2022-23568 (Integer Overflow, CWE-190, CVSS 6.5)  
CVE-2022-23569 (Buffer Overflow, CWE-617, CVSS 6.5)  
CVE-2022-21734 (Buffer Overflow, CWE-843, CVSS 6.5)  
CVE-2022-21737 (Buffer Overflow, CWE-754, CVSS 6.5)  
CVE-2022-21738 (Integer Overflow, CWE-190, CVSS 6.5)  
CVE-2021-29584 (Integer Overflow, CWE-190, CVSS 6.5)

## HONORS AND AWARDS

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**H13. Rising STARS Award, \$100,000, UT System, September, 2023**

**H12. Travel grant from IEEE S&P (2023), NDSS (2023), IEEE CNS (2022), WWW (2020)**

**H11. UVA Endowed Graduate Fellowship Award (Copenhaver Charitable Trust Bicentennial Fellowship)**, This award goes to a graduate student who has exceptionally good academic performance, research productivity (publications, presentations), and awards/honors, November 2022

**H10. Selected to participate in NRT Graduate Student Communication Research Series, August 2022**

**H9. Selected as CPS Rising Stars, April 2022**

**H8. UVA Endowed Graduate Fellowship Award (Carlos and Esther Farrar Fellowship)**, This award goes to a graduate student who has exceptionally good academic performance, research productivity (publications, presentations), and awards/honors, October 2021

**H7. Link Lab Outstanding Graduate Research Award**, This award goes to graduate student who has demonstrated excellence in research during the academic year, June 2020

**H6. Blackhat Grant**, Registration grant from BlackHat USA, August 2018

**H5. Bangladesh Sweden Trust Fund Scholarship**, July 2019

**H4. PhD Fellowship**, University of Virginia, March 2017

**H3. Runner-up at Mobile App Hackathon: Code Hub** by HEQEP, March 2014

**H2. Runner-up at Dev-Mercenaries System Prototyping & Development** by Department of CSE, BUET, March 2013

**H1. Top WP App at Windows App Hackathon** by Microsoft Bangladesh, March 2012

## ON-GOING RESEARCH WORK (LEAD AUTHOR)

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- **Vulnerable code detection:**

We build an automatic vulnerability detection tool using a machine learning approach. So far, we detect **59 zero-day** vulnerabilities and published **12 CVEs**. Those are available online and can be accessed at **here**. [Under Review]

- **Automatic code repair:**

We explore different code repair tools to investigate their **patching technique**. We propose measurements that will improve the performance of the existing tools. [In-preparation]

## TEACHING EXPERIENCE

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### Teaching

- CSE 4380: Information Security I, Spring 2024
- CSE 4380/5380: Information Security I, Fall 2023

### Graduate Teaching Assistant

- CS 6333: Mobile and IoT Security, 2020
- CS 8501: Hot Topics in Mobile and IoT Security, 2019
- CS 6501: Mobile and IoT Security, 2018
- I helped in designing the courses, created assignments, evaluated group projects, took a few classes. We continued working with the motivated team on their course group projects after the course. → **Published two workshop papers [MASSW'19, SPW'19]**

## MENTORING EXPERIENCE

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### Master Students

Faiza Tafannum, University of Texas at Arlington.

Avish Nitinbhai Modi, University of Texas at Arlington.

Zihao Su, University of Virginia → Current: Ph.D. Student at University of California, Santa Barbara.

Kaiming Cheng, University of Virginia → Current: Ph.D. Student at University of Washington.

Kamya Mehul Desai, University of Virginia → Current: Software Engineer, Credit Karma.

### Undergraduate Students

Muhammad Zaharudin, University of Texas at Arlington.

Chenghan Zhou, University of Virginia → Current: MSE, Princeton University.

Minjun Long, University of Virginia → Current: Ph.D. Student, Department of Computer Science at University of Virginia.

Patrick William Thomas, University of Virginia → Current: Software Engineer, Dr. Fit, Health and Wellness.

Liam Brennan, University of Virginia, Topic: Transfer learning-based vulnerable code detection.

Wentao Chen, University of Virginia, Topic: Transfer learning-based vulnerable code detection.

Erwin Wijaya, University of Virginia, Topic: GDPR Compliance Check.

Utkarsh Chirimar, University of Virginia, Topic: Adversarial machine learning in self-driving car.

Alex Kwakye, University of Virginia, Topic: Adversarial Machine Learning in policy analyzer.

Haowen Xu, University of Virginia, Topic: Adversarial Machine Learning in policy analyzer.

Vanessa Barlow, University of Virginia, Topic: Vulnerable code detection in complex software.

Mahesh Menon, University of Virginia, Topic: Vulnerable code detection in complex software.

David Hasani, University of Virginia, Topic: Sensitive data leakages in online platform.

Noah Basile, University of Virginia, Topic: Investigating security in voice devices.

Niya Venkatraman, University of Virginia, Topic: Investigating security in voice devices.

Christopher Lee, University of Virginia, Topic: Investigating security in voice devices.

Will Lampert, University of Virginia, Topic: Investigating security in voice devices.

Maven Kim, University of Virginia, Topic: Investigating security in voice devices.

Cooper Grace, University of Virginia, Topic: Identifying attack surface through formal verification.

Justin Nguyen-galante, University of Virginia, Topic: Privacy in trigger-action platform.

Courtney Laughlin, University of Virginia, Topic: Privacy in trigger-action platform.

Sohan Kabiraj, University of Virginia, Topic: Privacy exploit in browser.

## INDUSTRY EXPERIENCE

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### Research Intern in Baidu USA

June, 2021 - August, 2021

- Developing GDPR compliant android mobile application → **Published one paper [IEEE CNS'22]**
- *DelChk*: Validating data deletion practice in websites

Worked with Dr. Ping Li and Prof. Yingjie Lao

### Software Engineer in Kona SL

March, 2016 - July, 2017

- *Kona Money*, a payment solution, developed both in Android and iOS platform
- *ArtMining*, a CMS based project, developed in iOS platform
- *Nexus Pay*, leading payment solution in Bangladesh, developed in iOS platform and ingenico POS terminal in C platform

### Software Developer in Upwork [Profile Link]

January, 2013 - December, 2015

- Successfully completed 12 jobs on developing Android apps

## FEATURED

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**F2. CPS Rising Stars 2022** [Article]

**F1. Humans of Link Lab** [Article]

## TALKS

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**T9. NDSS, CHKPLUG:** Checking GDPR Compliance of WordPress Plugins via Cross-language Code Property Graph, February 2023

**T8. IEEE CNS, NL2GDPR:** Automatically Develop GDPR Compliant Android Application Features from Natural Language, October 2022

**T7. Guest Lecturer,** Security and Privacy analysis for voice personal assistant. Course: CS 8501: IoT Security and Privacy, February 2022

**T6. NSF CPS PI Meeting,** Privacy-aware Medical Voice Applications, June 2021

**T5. Baidu,** Data-driven Security and Privacy analysis for emerging system, December 2020

**T4. IMWUT/UbiComp,** VerHealth: Vetting Medical Voice Applications through Policy Enforcement, September 2020

**T3. The Web Conference,** Read Between the Lines: An Empirical Measurement of Sensitive Applications of Voice Personal Assistant System, April 2020

**T2. NDSS, TKPERM:** Cross-platform Permission Knowledge Transfer to Detect Overprivileged Third-party Applications, February 2020

**T1. NSysS,** Vulnerability Detection in Recent Android Apps: An Empirical Study, January 2017

## PROFESSIONAL SERVICES

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### INSIDE UTA

- PhD Admission Committee (September, 2023-present)
- Colloquia Committee (September, 2023-present)
- Judge at HackUTA (October, 2023)
- Judge at PhD Lightning Talks During 50th Anniversary of CSE Department (October, 2023)

### OUTSIDE UTA

#### **TPC**

ICWSM (2024, 2023), The Web Conference (2024), IEEE S&P (2024), Sensors S&P (2023), SafeThings (2023), ICICS (2023), CCS (Poster, 2022), IMC (Shadow TPC, 2022), USENIX Security (Poster, 2018)

#### **Web Chair**

SafeThings, 2023

#### **Session Chair**

IEEE S&P 2023, NDSS 2023, CCS 2022, WPES 2022 (co-located with CCS)

#### **External Reviewer**

PoPETs (2022), IMWUT/UbiComp (2022), ICWSM (2022), NordiCHI (2022), MobileHCI (Poster, 2022)

#### **Sub-Reviewer**

CCS (2018, 2019), IEEE S&P (2020, 2021, 2022), NDSS (2018, 2020, 2021, 2023), USENIX (2018, 2020), ASIACCS (2020), AAAI (2019), SENSYS (2020, 2021, 2022), CSF (2021), CHI (2021)

**Batch Representative of BSADD (BUET Systems Analysis, Design & Development) [link] (2015 - 2016)**

## REFERENCES

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Available upon request.