Ahmed Tanvir Mahdad

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Google Scholar | ResearchGate
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Appointments

- **Ohio University** — Athens, OH
  Assistant Professor, EECS — *Aug 2025 - Present*

Education

- **Texas A&M University** — College Station, Texas, US
  Doctor of Philosophy in Computer Science — *Aug 2021 - Aug 2025*
  ***Advisor**: Dr. Nitesh Saxena*
  ***Dissertation Title**: New Frontiers in Authentication and Side-Channels in Emerging Platforms: 2FA Attacks, Sensor Exploits, and AR/VR Security*
  ***Committee Members**: Dr. Nitesh Saxena, Dr. Guofei Gu, Dr. Juan Garay, Dr. Jeyvijayan Rajendran*

- **University of Alabama at Birmingham** — Birmingham, Alabama, US
  Doctor of Philosophy in Computer Science — *Aug 2019 - July 2021 (transferred)*
  Advisor: Dr. Nitesh Saxena

- **Bangladesh University of Engineering and Technology (BUET)** — Dhaka, Bangladesh
  B.S. in Computer Science & Engineering — *Jan 2006 - Feb 2011*

Research Interest

Authentication Security, Human-device Interaction, Sensor-assisted Biometrics, Wearable and AR/VR Privacy and Security, Application of AI/ML in Emerging Security Problems.

Awards and Honors

1. **Distinguished Paper Award**, ACM Conference on Computer and Communication Security (CCS), 2025
2. **Rising Star**, University of Iowa, 2024

Publications

Publications include: ACM TOPS, IEEE S&P, ACM CCS (4 papers), ACM MobiCom, WWW, IEEE ICDCS (2 papers).

Peer-reviewed Conference Publications:

1. **[CCS 2025]** Tianfang Zhang, Qiufan Ji, Zhengkun Ye, Md Mojibur Rahman Redoy Akanda, **Ahmed Tanvir Mahdad** Cong Shi, Yan Wang, Nitesh Saxena, and Yingying Chen. *"Harnessing Vital Sign Vibration Harmonics for Effortless and Inbuilt XR User Authentication""*, In proceedings of 2025 ACM SIGSAC Conference on Computer and Communications Security. [Distinguished Paper Award]
2. **[PST 2025]** Md. Imanul Huque, **Ahmed Tanvir Mahdad**, and Nitesh Saxena, *"Encryption Struggles Persist: When Tech-Savvy Students Face Challenges with PGP in Thunderbird"*, In the proceedings of 22nd Annual International Conference on Privacy, Security, and Trust, 2025.
3. **[WWW 2025]** Md Mojibur Rahman Redoy Akanda, **Ahmed Tanvir Mahdad**, Nitesh Saxena, *"Broken Access: On the Challenges of Screen Reader Assisted Two-Factor and Passwordless Authentication"*, In Proceedings of 2025 ACM Web Conference (WWW).
4. **[IEEE S&P 2025]** Zhengkun Ye, **Ahmed Tanvir Mahdad**, Yan Wang, Cong Shi, Yingying Chen, Nitesh Saxena, *"BPSniff: Continuously Surveilling Private Blood Pressure Information in the Metaverse via Unrestricted Inbuilt Motion Sensors"*, In Proceedings of 2025 IEEE Symposium on Security and Privacy (S&P).

5. [**CCS 2024**] **Ahmed Tanvir Mahdad** , Mohammed Jubur, Nitesh Saxena, *"Breaching Security Keys without Root: FIDO2 Deception Attacks via Overlays Exploiting Limited Display Authenticators"*, In proceedings of 2024 ACM SIGSAC Conference on Computer and Communications Security.
6. [**PST 2024**] **Ahmed Tanvir Mahdad** and Nitesh Saxena, *"Mobile Login Bridge: Subverting 2FA and Passwordless Authentication via Android Debug Bridge""*, In the proceedings of 21st Annual International Conference on Privacy, Security, and Trust, 2024.
7. [**CCS 2024**] Tianfang Zhang, Qiufan Ji, Zhengkun Ye, Md Mojibur Rahman Redoy Akanda, **Ahmed Tanvir Mahdad** Cong Shi, Yan Wang, Nitesh Saxena, and Yingying Chen. *"SAFARI: Speech-Associated Facial Authentication for AR/VR Settings via Robust VIbration Signatures"*, In proceedings of 2024 ACM SIGSAC Conference on Computer and Communications Security.
8. [**CCS 2023**] Tianfang Zhang, Zhengkun Ye, **Ahmed Tanvir Mahdad**, Md Mojibur Rahman Redoy Akanda, Cong Shi, Yan Wang, Nitesh Saxena, and Yingying Chen, *"FaceReader: Unobtrusively Mining Vital Signs and Vital Sign Embedded Sensitive Info via AR/VR Motion Sensors"*, In 2023 ACM SIGSAC Conference on Computer and Communications Security (pp. 446-459).
9. [**Mobicom 2023**] **Ahmed Tanvir Mahdad** , Mohammed Jubur, Nitesh Saxena, *"Breaking Mobile Notification-based Authentication with Concurrent Attacks Outside of Mobile Device"*, 29th Annual International Conference on Mobile Computing and Networking. pp. 1-15. 2023
10. [**ICDCS 2023**] **Ahmed Tanvir Mahdad**, Cong Shi, Zhengkun Ye, Tianming Zhao, Yan Wang, Yingying Chen and Nitesh Saxena, *"EmoLeak: Smartphone Motions Reveals Emotions"*, In the proceedings of 43rd IEEE International Conference on Distributed Computing Systems (pp. 316-326). IEEE, 2023
11. [**Wisec 2023**] **Ahmed Tanvir Mahdad** and Nitesh Saxena, *"SoK: A Comprehensive Evaluation of 2FA-based Schemes in the Face of Active Concurrent Attacks from User Terminals"*, In the proceedings of 16th ACM Conference on Security and Privacy in Wireless and Mobile Networks, pp. 175-186. 2023
12. [**ICDCS 2022**] Cong Shi, Tianming Zhao, Wenjin Zhang, **Ahmed Tanvir Mahdad** , Zhengkun Ye, Yan Wang, Nitesh Saxena and Yingying Chen, *"Defending against Thru-barrier Stealthy Voice Attacks via Cross-domain Sensing on Phoneme Sounds"*, In the proceedings of 42nd IEEE International Conference on Distributed Computing System. pp. 680-690. IEEE, 2022.
13. [**ICICS 2021**] **Ahmed Tanvir Mahdad** , Mohammed Jubur, Nitesh Saxena, *"Analyzing the Security of OTP 2FA in the Face of Malicious Terminals"*, 23rd International Conference on Information and Communication Security. Proceedings, Part I 23, pp. 97-115. Springer International Publishing, 2021.

Peer-reviewed Journal Publications:

1. [**ACM TOPS**] Prakash Shrestha, **Ahmed Tanvir Mahdad**, Nitesh Saxena. *Sound-based Two-factor Authentication: Vulnerabilities and Redesign*, ACM Transactions on Privacy and Security, 27(1), 1-27, 2024

Other Peer-reviewed Publications:

1. [**SEC 2025**] Zhengkun Ye, **Ahmed Tanvir Mahdad**, Yan Wang, Cong Shi, Yingying Chen, and Nitesh Saxena. 2025. *VR Testbed-based Blood Pressure Privacy Leakage Analysis.* In Proceedings of the Tenth ACM/IEEE Symposium on Edge Computing (SEC '25).
2. [**MobiHoc 2023**] Tianfang Zhang, Zhengkun Ye, **Ahmed Tanvir Mahdad**, Md Mojibur Rahman Redoy Akanda, Cong Shi, Yan Wang, Nitesh Saxena, and Yingying Chen, *"Poster: Unobtrusively Mining Vital Sign and Embedded Sensitive Info via AR/VR Motion Sensors"*, In proceedings of the 24th International Symposium on Theory, Algorithmic Foundations, and Protocol Design for Mobile Networks and Mobile Computing. pp. 308-309. 2023.
3. [**MobiSys 2022**] Tianming Zhao, Zhengkun Ye, Tianfang Zhang, Cong Shi, **Ahmed Tanvir Mahdad**, Yan Wang, Yingying Chen, Nitesh Saxena, *"Poster: Continuous Blood Pressure Monitoring Using Low-cost Motion Sensors on AR/VR Headsets"*, In proceedings of the 20th ACM International Conference on Mobile Systems, Applications, and Services. pp. 589-590. 2022

Pre-prints:

1. [**ArXiv**] **Ahmed Tanvir Mahdad**, Cong Shi, Zhengkun Ye, Tianming Zhao, Yan Wang, Yingying Chen and Nitesh Saxena, *"Earspy: Spying caller speech and identity through tiny vibrations of smartphone ear speakers"*, arXiv preprint arXiv:2212.12151 (2022)

Invited Talks and Presentations

- **Invited Talks**:

  1. *On the Insecurity of Authentication in Untrusted Terminals: An Evaluation of FIDO2 Keys, Notification-Based Authentication, and More*, Rising Star Talk, University of Iowa, Iowa City, IA, USA, December 2024

- **Conference Presentations**:

  1. *Breaching Security Keys without Root: FIDO2 Deception Attacks via Overlays exploiting Limited Display Authenticators*, 2024 ACM SIGSAC Conference on Computer and Communications Security (CCS), Salt Lake City, UT, USA, October 2024
  2. *Breaking Mobile Notification-based Authentication with Concurrent Attacks Outside of Mobile Devices*, 29th Annual International Conference on Mobile Computing and Networking (MobiCom 2023), Madrid, Spain, October 2023
  3. *Mobile Login Bridge: Subverting 2FA and Passwordless Authentication via Android Debug Bridge*, 21st Annual International Conference on Privacy, Security and Trust (PST), (Virtual), August 2024
  4. *Analyzing the Security of OTP 2FA in the Face of Malicious Terminals*, Information and Communications Security: 23rd International Conference, ICICS 2021, (Virtual), November 2021

Teaching Experience

- **Ohio University** — Athens, OH
  Assistant Professor — *August 2025 - Present*
  - **CS 4770/5770 - Introduction to Computer Software Security Engineering**: (Fall 2025)
  - **CS 4900/5900 - Cryptography and Secure Communication**: (Spring 2026)

Professional Services

- **Service at Ohio University**:
  1. **Committee Member**:
     (a) Assessment and Accreditation(CS) (Fall 2025- Present)
     (b) Assessment and Accreditation(EE) (Fall 2025- Present)
     (c) Graduate Research (Fall 2025 - Present)

- **External Services**:
  1. **Program Committee Member**:
     (a) IEEE Secure Development Conference (IEEE SecDev), 2025
     (b) 23rd Annual International Conference on Privacy, Security, and Trust (PST 2026)
  2. **Reviewer**:
     (a) ACM Transactions on Privacy and Security (2022, 2024)
     (b) IEEE Transactions on Mobile Computing (2022, 2023)
     (c) IEEE Transactions on Dependable and Secure Computing (2022)
     (d) Springer Mobile Networks and Applications (2021, 2023)
  3. **Sub-reviewer**:
     (a) International Conference on Information and Communications Security (ICICS) (2020, 2021)
     (b) 7th IEEE European Symposium on Security and Privacy (Euro S&P) (2022)
     (c) 20th International Conference on Applied Cryptography and Network Security (ACNS) (2022)
     (d) IEEE Conference on Communications and Network Security (CNS) (2021)
     (e) ACM The Web Conference (WebConf) (2020, 2021)
     (f) Annual Computer Security Applications Conference (ACSAC) (2023)
     (g) 30th ACM Conference on Computer and Communications Security (CCS) (2023)

Current students

- **Ph.D. Students**:
  1. Shaznin Sultana (Fall 2025- Present)

Selected Media Coverages

- [Texas A&M Today]Researchers Hack Android Smartphones, Find A Security Risk
- [Texas A&M Engineering]Research hack reveals call security risk in smartphones
- [Android Headlines]EarSpy can spy on your phone calls by using motion sensors
- [Android Police]EarSpy can eavesdrop on your phone conversations using motion sensors
- [SecurityWeek]EarSpy: Spying on Phone Calls via Ear Speaker Vibrations Captured by Accelerometer
- [BleepingComputer]EarSpy attack eavesdrops on Android phones via motion sensors

Industry Experience

- **TigerIT Bangladesh Limited** Dhaka, BD
  Principal Software Engineer *February 2014 - July 2019*
  - **Design**: Design and Manage Testing Plan for Different Projects
  - **Security Testing**: I was also responsible of designing and executing security testing for multiple products.
  - **Communication**: Communicate with clients and stakeholders and manage requirements and evaluate changes
  - **Development**: I was responsible of developing testing frameworks for different projects and specific requirements.
- **Therap Services, LLC** Dhaka, BD
  Senior Software Engineer *February 2011 - January 2014*
  - **Requirement Analysis**: I was responsible for requirement analysis and design testing plan
  - **Security and Usability Testing**: I designed security and usability testing according to the requirement and execute them using our designed automation program and tools.

Professional Memberships

- Association for Computing Machinery (ACM) (2022 - present)