

## EDUCATION

- **North Carolina State University** Raleigh, NC  
*Ph.D in Computer Science* August, 2018 - May, 2023 (Expected)
  - **Dissertation Title:** Compliance of Android Payment Applications to Industry Security Standards
  - **Research Interest:** Software Security, Payment Security, Privacy
- **Bangladesh University of Engineering and Technology (BUET)** Dhaka, Bangladesh  
*Bachelor of Engineering in Computer Science and Engineering* Graduated March, 2016

## EXPERIENCE

- **Wolfpack Security and Privacy Research Lab** NCSU, Raleigh, NC  
*Research Assistant* May 2019 - present
  - **Area:** My research broadly falls within the areas of systems security and privacy. Currently I work on analyzing and improving the security of mobile payment systems and protocols. I apply different program analysis and reverse engineering techniques to discover vulnerabilities in Android applications.
- **Meta Platforms** Menlo Park, CA  
*Software Engineering Intern (AI Security)* Summer 2022
  - **Storing ACL Policy:** Designed and implemented a robust solution for securely storing ACL policy of Meta's AI assets.
- **PayPal Inc.** Scottsdale, AZ  
*Research Intern (InfoSec)* Summer 2021
  - **Mobile payment SDK misuse:** Identified and measured several ways PayPal's in house mobile Payment SDKs (i.e., Braintree, PayPal) could be misused in both Android and iOS.
- **KONA** Dhaka, Bangladesh  
*Software Engineer* March 2016 - July 2018
  - **Nagad:** Nagad is a digital financial solution for payment and money transfer in Bangladesh serving 55+ million people.
  - **Nexus Pay:** Nexus Pay is a payment solution which allows its user to virtually register his credit/debit card on his mobile application and pay simply by scanning QR code on merchant points.

## RESEARCH PROJECTS

- **AARDroid - investigating security weaknesses in Android Payment SDKs:** Built a static analysis tool to analyze 50 payment SDKs in Android. Our findings report saving unencrypted credit card information, use of insecure cryptographic primitives, insecure input methods for credit card information, insecure use of WebViews, etc
- **Cardpliance (PCI DSS compliance in Android apps):** Built an analysis tool to measure if credit card asking android applications are adhering to industry security standards like PCI-DSS. Our study indicate the compliance landscape of popular consumer applications collected from Google Play is fairly positive.
- **Investigating self contradicting privacy policy:** We built a tool that uses NER to extract entities from privacy policies to build an ontology. It later uses NLP to perform entity sensitive analysis on the privacy policy to find internal inconsistencies. Furthermore it reasons over the app behaviour of data collecting and sharing practices with the privacy policies.

## SELECTED PUBLICATIONS

- Analysis of Payment Service Provider SDKs in Android, *In Proceedings of the Annual Computer Security Applications Conference (ACSAC), December 2022, Austin, TX, USA.*
- Cardpliance: PCI DSS Compliance of Android Applications, *In Proceedings of the USENIX Security Symposium, Boston, MA, USA, 2020* (acceptance rate=16.3%)
- Actions Speak Louder than Words: Entity-Sensitive Privacy Policy and Dataflow Analysis with PoliCheck, *In Proceedings of the USENIX Security Symposium, Boston, MA, USA, 2020* (acceptance rate=16.3%)
- PolicyLint: Investigating Internal Privacy Policy Contradictions on Google Play, *In Proceedings of the USENIX Security Symposium, Santa Clara, CA, 2019* (acceptance rate=16.2%).

## SKILLS SUMMARY

- **Languages:** Java (Preferred), Python, C++, PHP, Scala, SQL, Thrift, Swift,
- **Analysis Frameworks:** Amandroid, Flowdroid, UiRef, QARK, Androdguard, Wireshark, LibScout
- **Reverse Engineering::** APKTool, ADB, dex2Jar, JADX, Byteviewer, JEB, Frida, Hopper
- **Others:** Linux, Android, Git, Latex

## HONORS AND AWARDS

- Awarded **Best Poster Award** in Hot Topics in Science of Security (HotSoS) Symposium - April, 2022
- University Dean's Merit list, March 2016

## VOLUNTEER EXPERIENCE

- **Workshop Lead at DiamondHacks '21** NCSU, Raleigh, NC  
*Conducted a workshop on Android application development at DiamondHacks 2021* March, 2021