Mohammad Ishtiaq Ashiq Khan

(540) 449-8267 iashiq5@vt.edu Blacksburg, VA Homepage LinkedIn GitHub Google Scholar

Education

Blacksburg, VA **Jan 2021 - Dec 2025 (Expected)**
- Ph.D. in Computer Science and Applications at **Virginia Tech**

Blacksburg, VA **Jan 2021 - Dec 2023**
- M.Sc. in Computer Science and Applications at **Virginia Tech**, CGPA: 3.88

Dhaka, Bangladesh **Jul 2014 - Oct 2018**
- B.Sc. in Computer Science at **Bangladesh University of Engineering and Technology (BUET)**, CGPA: 3.83

Experience

Software Engineer Intern **Meta** **May 2023 - Aug 2023**
- Developed a custom plugin in Flipper for FB4A's in-app browser (Chromium) development and debugging
- Stack: Android (Kotlin/Java), React (TypeScript), Buck, etc.

Graduate Research Assistant **Virginia Tech** **Jan 2021 - Present**
- Conducting data-driven research aimed at enhancing management and security of **Email**, **DNS**, and **PKI**.
- Stack: Apache Spark, MongoDB, PostgreSQL, Node.js, Docker, Django Rest, Redis, AWS, etc.

Lecturer **United International University** **Jul 2019 - Dec 2020**
- Taught Network Security, Data Structure, Object-Oriented Programming, etc. undergraduate courses.

Full Stack Software Engineer **InfoSapex Limited** **Nov 2018 - Jul 2019**
- Successfully released a Procurement Management System in production with over 50% contribution.
- Served as a technical point of contact with clients and carried out requirement analysis.
- Significantly reduced server provisioning time by automating configurations with Puppet and recovery time by setting up monitoring service with Munin and Nagios.
- Stack: Django Rest, Node.js, jQuery, HTML/CSS, Bootstrap, PostgreSQL, Celery, etc.

Selected Publications

- *SPF Beyond the Standard: Management and Operational Challenges in Practice and Practical Recommendations* in **USENIX Security 2024**.
  - *Authors:* **Md. Ishtiaq Ashiq**, Weitong Li, Tobias Fiebig, and Taejoong Chung.
  - Analyzed the server-side misconfigurations of SPF and proposed an attack scheme to prevent victims from temporarily receiving emails.
- *RoVista: Measuring and Analyzing the Route Origin Validation in RPKI* in **Internet Measurement Conference 2023**.
  - *Authors:* Weitong Li, Zhexiao Lin, **Md. Ishtiaq Ashiq**, Emile Aben, Romain Fontugne, Amreesh Phokeer, Taejoong Chung.
  - Proposed a network measurement framework, RoVista, to determine the Route Origin Validation status at scale.
- *You've Got Report: Measurement and Security Implications of DMARC Reporting* in **USENIX Security 2023**.
  - *Authors:* **Md. Ishtiaq Ashiq**, Weitong Li, Tobias Fiebig, and Taejoong Chung.
  - Analyzed the DMARC Reporting landscape longitudinally and empirically. Proposed a couple of DoS vulnerabilities in 3 major email providers with amplification factor over 1400x leveraging DMARC and TLS-RPT reporting.
- *Measuring TTL Violation of DNS Resolvers in the Wild* in **Passive and Active Measurement 2023**.
  - *Authors:* Protick Bhowmick, **Md. Ishtiaq Ashiq**, Casey Deccio, and Taejoong Chung.
  - Designed the measurement infrastructure and APIs for the DNSSEC experiment using Docker and Django Rest.
- *Under the Hood of DANE Mismanagement in SMTP* in **USENIX Security 2022**.
  - *Authors:* Hyeonmin Lee, **Md. Ishtiaq Ashiq**, Moritz Muller, Roland van Rijswijk-Deij, Taekyoung Kwon, and Taejoong Chung.
  - Automated the DANE key rollover scheme in a popular open-source email provider.
- *Measurement and Analysis of Automated Certificate Reissuance* in **Passive and Active Measurement 2021**.
  - *Authors:* Olamide Omolola, Richard Roberts, **Md. Ishtiaq Ashiq**, Taejoong Chung, Dave Levin, and Alan Mislove.

  - Examined SSL certificates issued by leading CAs to identify certificate misissuances based on CAA records.
- *Domain Flux based DGA Botnet Detection Using Feedforward Neural Network* in **Military Communications Conference 2019**.
  - *Authors:* **Md. Ishtiaq Ashiq**, Protick Bhowmick, Md. Shohrab Hossain, and Husnu S. Norman.

Selected Projects

- **Revisiting the NXNS Attack** (2022). Developed a scalable technique to measure patches for the attack in local resolvers leveraging a proxy network, [details].
- **Transferability of Adversarial Training in Text Domain** (2021). Conducted a study to check transferability of adversarial training across popular adversarial frameworks. Framework: PyTorch, [Link].
- **DNSSEC Debugger** (2021). Analyzed historical DNSViz data to understand the challenges for DNS administrators while deploying and managing DNSSEC. Presented in **36th DNS-OARC Workshop**, [Link].
- **Robustness Analysis of a Web Honeypot** (2021). Demonstrated common web vulnerabilities in a popular web honeypot framework (SNARE-TANNER), [details].

Languages and Technologies

Languages Python, Java, C++, C, JavaScript, Go, Kotlin, TypeScript, HTML, CSS, Assembly (x86), R
Frameworks and Technologies Django Rest, Tensorflow, Apache Spark, PyTorch, Node.js, familiar with Android, React
DBMS Oracle SQL, PostgreSQL, MongoDB, Redis, Elasticsearch
VCS Git, Sapling
Tools Docker, Vagrant, Hugo, Gulp, Buck, Celery, Grafana, AWS Services (S3, EC2) etc.

Additional Experience and Awards

- **Instructor, Virginia Tech:** Taught Intermediate Software Design course during Summer 2023.
- **Open Source Contributions:** Contributed to 3 open-source projects: Mail-in-a-Box, iRedAPD, and TextAttack.
- Awarded *University Merit List Scholarship*, and *Dean's List Scholarship* during bachelor's.