Mohiuddin Ahmed | Portfolio | GitHub | LinkedIn | Google Scholar

Melbourne, FL (Open to Relocation) | sohel.buet.cse.07@gmail.com | +19802670371 | Visa Status: **Permanent Resident**

Education

- **Doctor of Philosophy (Ph.D.)** in Computing and Information Systems. [August 2016 - March 2024]
  - ◇ University of North Carolina at Charlotte, NC, USA.
- **Bachelor of Science** in Computer Science and Engineering. [January 2008 - February 2013]
  - ◇ Bangladesh University of Engineering and Technology (BUET), Dhaka, Bangladesh.

Professional Experiences

- **Research Assistant**, University of North Carolina at Charlotte, NC, USA. [August 2016 - April 2024]
  - ◇ Developed security analytics for distributed threat hunting and automated critical security control enforcement assessment.
- **Team Lead, Software Engineer**, Kona Software Lab Ltd, Dhaka, Bangladesh. [January 2016 - June 2016]
- **Software Engineer**, Kona Software Lab Ltd, Dhaka, Bangladesh. [March 2014 - December 2015]
  - ◇ Implemented dynamic libraries (.dll, .so, and .dylib) for PKI system and CA toolkits using *Java and C++*.
- **Junior Software Engineer**, Nascenia, Dhaka, Bangladesh. [March 2013 - February 2014]
  - ◇ Developed sports analytic APIs for sports websites using PHP, MODX CMS, SOAP, REST, JSON, and XML parsing.

Professional Skills

- **Languages and Frameworks:**
  - ◇ **Expert:** Python, Java, C++, C, Shell Scripting, Java Spring Boot, JVM, JavaScript, jQuery, SQL, MySQL, Oracle SQL, MongoDB, Elasticsearch, RabbitMQ, OpenSSL, Cryptography, NumPy, Pandas, Jupyter Notebook, CoreNLP, NLTK, Scikit-learn, Keras, ML, Prompt Engineering, LangChain, TCP/IP, MITRE ATT&CK, NIST CSF, CIS CSC.
  - ◇ **Working Knowledge:** R, PHP, C#, TensorFlow, Terraform, Ansible, Chef InSpec, Apache Kafka, Apache Flink.
- **Tools and Platforms:**
  - ◇ **Expert:** IDAPro, OllyDbg, Docker, Gradle, CMake, VirtualBox, VMWare, Git, Scrum/Agile.
  - ◇ **Working Knowledge:** Kubernetes, AWS VDI, Azure, Weka, Gephi, Maven, Splunk, UML

Professional Projects

- **PKI-Middleware**, A PKI dynamic library developed for Windows, Linux, MAC, and Android platforms which complies with *KISA* and *FIPS* standards. Implemented multi-threading and multiprocessing, smart card profile initialization, asymmetric and symmetric key generation, encrypt and decrypt operation, and X.509 certificate generation, sign, and verify operation. *Tools Used: C++, OpenSSL, JavaCard OS.* [April 2014 - December 2015]

- **Custom CSP**, A *Cryptographic Service Provider,* MSDN Compatible library that implements Microsoft's *CryptoAPI (CAPI).* Implemented NFC-based smart card authentication in Windows OS using Custom CSP. *Tools Used: C++, Windows API, OpenSSL.* [January 2016 - June 2016]

- **CMS**, *Cryptographic Message Syntax* is a *PKCS#7* based toolkit developed to support the *CA System* during the certificate Issuance that supports all data types (*Signed, Enveloped, SignedAndEnveloped, data*) of *PKCS#7* and their operations. *Tools Used: Java.* [May 2015 - June 2015]

Dissertation Research Projects

- **CIS Critical Security Control (CSC) Assessment**, Automated extraction of threat actions, what-to-measure (observables), and development of key measurement indicators (KMI) and metrics to assess and evaluate each CSC safeguard enforcement. *Tools Used: NLP, Python, gpt-3.5-turbo, LangChain, Prompt Engineering.* [August 2018 - March 2024]

- **Scalable-Hunter**, Distributed hierarchical event monitoring system for threat hunting. Designed and implemented distributed hierarchical event monitoring system to reduce attack detection time, communication overhead and resource usage. *Tools Used: Python, Java, RabbitMQ, Elasticsearch, Docker, ETW.* [August 2019 - July 2023]

- **TTPHunter**, Automatic and accurate extraction of threat actions from unstructured text of CTI Sources and mapping of threat actions to MITRE ATT&CK techniques. Extracted threat actions and attacker TTPs from CTI reports using NLP and similarity measures- TF-IDF. *Tools Used: Java, CoreNLP, TF-IDF.* [January 2017 - July 2018]

Publications

- **Mohiuddin Ahmed**, Jinpeng Wei, Ehab Al-Shaer. (2024). Prompting LLM to Enforce and Validate CIS Critical Security Control. (ACM SACMAT 2024).

- **Mohiuddin Ahmed**, Jinpeng Wei, Ehab Al-Shaer. (2023). SCAHunter: Scalable Threat Hunting through Decentralized Hierarchical Monitoring Agent Architecture. (Computing 2023).

- Sharun Akter Khushbu, Nasheen Nur, **Mohiuddin Ahmed**, Nashtarin Nur. (2023). A Comparison of Traditional to Advanced Linguistic Models to Analyze Sentiment in Bangla Texts. (EMNLP 2023 workshop BLP).

- **Mohiuddin Ahmed**, Jinpeng Wei, Yongge Wang and Ehab Al-Shaer. (2018). A Poisoning Attack Against Cryptocurrency Mining Pools. (ESORICS CBT 2018).

- **Mohiuddin Ahmed**, Ehab Al-Shaer. (2019). Measures and Metrics for the Enforcement of Critical Security Controls: a Case Study of Boundary Defense. (HOTSOS 2019).

- Ghaith Husari, Ehab Al-Shaer, **Mohiuddin Ahmed**, Bill Chu, and Xi Niu. (2017). TTPDrill: Automatic and Accurate Extraction of Threat Actions from Unstructured Text of CTI Sources. (ACSAC 2017).

- Rawan Al-Shaer, **Mohiuddin Ahmed**, Ehab Al-Shaer. (2018). Statistical Learning of APT TTP Chains from MITRE ATT&CK. (RSA Conference, 2018).

- Mohammed Noraden Alsaleh, Jinpeng Wei, Ehab Al-Shaer and **Mohiuddin Ahmed**. (2018). gExtractor: Towards Automated Extraction of Malware Deception Parameters. (SSPREW-8, 2018).