Muhammad Saad

Personal Data

Address: Room No. 367, Research 1, University of Central Florida
Phone: +1 407 717 6554
email: saad.ucf@knights.ucf.edu
website: https://www.cs.ucf.edu/msaad

Education

August 2017 — PhD Computer Science,
University of Central Florida,
Area: "Blockchain Technology: Applications,
Attack Surface, and Countermeasures" | Advisor: Dr. Aziz Mohaisen

June 2017 — Masters in Electrical Engineering
Lahore University of Management Sciences
Thesis: "Towards Detecting Collusion Networks and Reputation Manipulation on Twitter" | Advisor: Dr. Fareed Zaffar

June 2014 — Bachelors in Electrical Engineering
National University of Science and Technology

Research Interests

Blockchain Technology: Applications and Attack Surface, Cryptocurrencies, Security and Privacy, Measurement and Modeling of Computer Systems.

Work Experience

Current / August 2017 — Research Assistant at SEAL
Member of the Security Analytics Research Lab supervised by Aziz Mohaisen. My research area spans blockchain technology, attack surface of blockchains, cryptocurrencies, smart contracts, and cryptography. Currently I am working on improving the consensus mechanisms in blockchains to achieve high throughput and scalability.

June 2014 / January 2014 — Software Developer and Graphics Designer at TereSol
Member of software development team that worked on secure and scalable VoIP systems over 4G. Additionally, I was given the responsibility to lead the graphics designing team to develop creative artworks for our products.

August 2014 / May 2014 — Intern at FAB
Served as an Intern at Frequency Allocation Board Pakistan. My responsibilities included monitoring wireless communication of service providers and providing quality assurance.

Publications

- **Muhammad Saad**, Charles Kamhoua, Laurent Njilla, and Aziz Mohaisen. Countering Selfish Mining in Blockchains. IEEE International Conference on Computing, Networking and Communication, **ICNC 2019** Honolulu, HI, USA.
- Ashar Ahmad, **Muhammad Saad**, Mostafa Bassiouni, and Aziz Mohaisen. Towards Blockchain-Driven, Secure and Transparent Audit Logs. International Workshop on Distributed Ledger of Things, **DLoT 2018** (in conjunction with **MobiQuitous 2018**), New York City, USA. (**Best Paper Award**).
- **Muhammad Saad**, Aminollah Khormali, and Aziz Mohaisen. End-to-End Analysis of In-Browser Cryptojacking. Computing Research Repository, **Arxiv 2018**.
- **Muhammad Saad**, My.T.Thai, and Aziz Mohaisen. POSTER: Deterring DDoS Attacks on Blockchain-based Cryptocurrencies through Mempool Optimization. ACM Asia Conference on Computer and Communications Security, **AsiaCCS 2018**, Incheon, Korea.
- **Muhammad Saad** and Aziz Mohaisen. Towards Characterizing Blockchain-based Cryptocurrencies for Highly-Accurate Predictions. International Workshop on Hot Topics in Pervasive Mobile and Online Social Networking, **HotPOST 2018** (in conjunction with **IEEE INFOCOM 2018**), Honolulu, HI, USA.

Major Projects

Analysis of Blockchain Technology and its Attack Surface (Ongoing Work)
(Supervisor: Dr. Aziz Mohaisen , Sept'17 - Present)

- Analyzing the the vulnerabilities of Blockchain technology pertaining to the Blockchain's data constructs, underlying distributed system and application contexts.
- Analyzing the attack surface of blockchains and exploring suitable countermeasures.
- Countering double-spending attack in Blockchains using one-time signatures.
- Countering distributed denial-of-service attacks on Blockchain based technologies.
- Characterizing the price hike in Blockchain-based cryptocurrencies.
- End-to-end analysis of browser-based cryptojacking attacks and devising efficient countermeasures.
- Extending the scope of blockchains beyond proof-of-work and proof-of-stake for higher scalability and throughput.

Sentiment Analysis and Topic Modeling on Twitter (MS Thesis)
(Supervisor: Dr. Fareed Zaffar , Sept'16 - May '17)

- Twitter API and web scrapers to collect data from Twitter.
- AFINN-165 wordlist and emoji sentiment ranking to monitor sentiments in Tweets.
- Latent Dirichlet allocation topic modeling technique to outline topics in text corpus.
- Machine learning techniques to measure the change in people's political views over time and correlating that to the group of peers surrounding them.

Youtube Censorship Issues in Pakistan (Research Project)
(Supervisor: Dr. Fareed Zaffar , Dec'16 - March '17)

- Identifying misuse of Youtube services in Pakistan including censorship breaches and copyrights violations.
- Analyzed the effects of engineered traffic on videos and channels.
- Used Error Level Analysis to track image manipulation.

Technical Skills

Programming Languages : C++, Java, JavaScript, HTML, CSS, MATLAB, and Python.

Back-end Development: : NodeJS, MySQL, MongoDB, and Amazon AWS.

Front-end Development: : AngularJS and Bootstrap.

Development Frameworks : Hyperledger, Multichain, and Openblockchain.

Services

External Reviwer: I have actively served as an external reviwer for the following conferences. INFOCOM 2018, INFOCOM 2019, ICWSM 2019, ICC 2019, ETRI Journal (Wiley).

Mentor: k-12 students for a security and privacy summer camp. My responsibilities include training the students in the domain of online privacy, hacking, and defense strategies. An essential component is to motivate students to join the field of computer science in future.