

Md Raihan Ahmed

SOFTWARE ENGINEER · SECURITY EXPERT

Salt Lake City, Utah, USA

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“Let me help you make the change that you want to see in this world.”

Education

University of Utah

PH.D. IN COMPUTER SCIENCE, GPA: 3.86

Utah, USA

Aug. 2021 - PRESENT

University of Utah

MS. IN COMPUTER SCIENCE, GPA: 3.86

Utah, USA

Aug. 2021 - May 2024

Skills

Programming Lang.	Python, C/C++, Javascript, React.js, Node.JS, C#, JAVA, PHP, Typescript, Go, x86 Assembly
Compiler Dev. Tools	LLVM (used to build instrumentation tool)
Security Tools	Metasploit, Nmap, Burp Suite, Wireshark, AFL, AFL++, sqlmap, tcpdump, ghidra, IDA Pro
Frameworks	React.js, Node.js, Express.js, Android Native, Spring, Dot(.) Net
Data Science & ML	Tensorflow, Keras, NumPy, scikit-learn, Pandas, Matplotlib
Database	Oracle SQL, MySQL, MongoDB
Mining & Visualization Tools	gSpan, PrefixSpan, Graphviz
Dev. & Deployment Tools	GitHub, Docker, Kubernetes
Softwares Used	Neovim, tmux, vim, vs code
Data Analysis Software	Matlab, Google Colab, Jupyter, Anaconda
Building tools	Makefile, CMake, Ninja, Gradle
Others & OS's used	Shell Scripting, sh, Bash, Zsh, Powershell, NixOS, Ubuntu, Kali Linux, macOS
Languages	English, Bangla, Hindi, Urdu

Experience

University of Utah

RESEARCH ASSISTANT

Utah, USA

Aug. 2021 - Current

- Implemented a tracking software to trace all the activities of the System to secure (or ensure security of) CPS/ICS
- Efficiently built ICSTracker with C++ & LLVM to detect attacks and tested on fischertechnik training factory(4.0) and SWaT water testbed.

University of Utah

TEACHING ASSISTANT

Utah, USA

- Teaching Assistant for CS 4400-001 - Computer System in Fall-2022 & Fall-2024
- Teaching Assistant for CS 6956-001 - Software and System Security in Spring-2023

Projects

ICSTracker: To Trace back to the source of Intrusion in Industrial IoT Systems.

C++, LLVM, Python

PHD 1ST PROJ

GitHub Aug. 2021 - May 2024

- It's a physical process-aware, cross-iteration and cross- domain approach to backtracking intrusions in ICS
- Crafted detailed instrumentation passes to capture critical runtime data from ICS controllers; improved data collection accuracy by 56%, to enable more effective troubleshooting for complex system failures.

Personal Portfolio with React.js

React.js, Javascript

PORTFOLIO

GitHub Aug. 2022 - Dec. 2022

- Built my portfolio site with react.js.

Interactive Visualization tool

DATA VISUALIZATION COURSE

Javascript
GitHub Aug. 2022 - Dec. 2022

- Built website with javascript to explore video game sales by year and platform.

Fuzzing XPDF-4.05

APPLIED S/W SECURITY TEST. COURSE

LLVM, C++
Git1 Git2 Aug. 2022 - Dec. 2022

- Discovered Critical bugs in XPDF with AFL++

Rollback attack in Cars

CYBER-PHYS SYS & IoT SECURITY COURSE

Arduino, C++
GitHub Aug. 2022 - Dec. 2022

- Built a rollback device with Arduino to access cars without using keys.

Publications

Re-design Industrial Control Systems with Security (RICSS)

CONTEXT-AWARE INTRUSION DETECTION IN INDUSTRIAL CONTROL SYSTEMS

Utah, USA

Oct. 2024

- Developed a provenance-based method with Linear Temporal Logic (LTL) to enhance ICS attack detection in information security.

Biointerface Research in Applied Chemistry

OVARIAN CANCER SUBSTANTIAL RISK FACTOR ANALYSIS BY MACHINE LEARNING: A LOW INCOMING COUNTRY

Bangladesh
paper Jul. 2020

- Analyzed ovarian cancer data using various machine learning algorithms to identify significant risk factors

BMC bioinformatics

MACHINE LEARNING TO REVEAL AN ASTUTE RISK PREDICTIVE FRAMEWORK FOR GYNECOLOGIC CANCER AND ITS

Bangladesh
GitHub paper Apr. 2021

IMPACT ON WOMEN PSYCHOLOGY: BANGLADESHI PERSPECTIVE

- Developed a predictive algorithm using machine learning to assess the risk of cervical and ovarian cancer associated with stress

Electrical, Computer and Communication Engineering (ECCE)

A COMPARATIVE ANALYSIS OF TRADITIONAL AND MODERN DATA COMPRESSION SCHEMES FOR LARGE

Bangladesh
paper Feb. 2019

MULTIDIMENSIONAL EXTENDIBLE ARRAY

- Compared traditional and modern data compression schemes for multi-dimensional data and concluding that the Extendible Array Based Compression Scheme (EaCRS) is most efficient

Elsevier

A BIOINFORMATICS APPROACH FOR IDENTIFICATION OF THE CORE ONTOLOGIES AND SIGNATURE GENES OF

Bangladesh
paper Jul. 2020

PULMONARY DISEASE AND ASSOCIATED DISEASES

- Spotted out significant common genes and proteins among COPD, DM, CR, IHD, IS, TB, and OB diseases, to suggest drug signatures.

Journal of Proteins and Proteomics

PROTEIN INTERACTION NETWORK AND DRUG DESIGN OF STOMACH CANCER AND ASSOCIATED DISEASE: A

Bangladesh
paper Dec. 2020

BIOINFORMATICS APPROACH

- Identified common genes among seven diseases (OB, SC, CC, PC, PRC, LK, MD) to analyze their biological and genetic network.

Extracurricular & Honors

DOMESTIC

- | | | |
|------|---|---------------------------|
| 2022 | Volunteered at the ACM Conference on Computer and Communications Security (CCS) | <i>Las Angeles, U.S.A</i> |
| 2022 | Reviewed 19+ papers from renowned conferences e.g., ESWA, COSE, IoT. | <i>Utah, U.S.A</i> |
| 2022 | Community Manager of Utah Security Club (UofU) | <i>Utah, U.S.A</i> |

INTERNATIONAL

- | | | |
|------|--|-------------------|
| 2017 | Grantee of Lutfar Rahman Scholarship (GPA 4.00) in the first year of undergraduate degree. | <i>Bangladesh</i> |
| 2019 | Achieved first place in Beetles Hack tag Contest in 4th year of undergraduate degree. | <i>Bangladesh</i> |
| 2019 | Granted special award(4th Place) for Mobile app contest (DIU Carnival) in 3rd year of undergrad. | <i>Bangladesh</i> |
| 2019 | Participated in Competitive Programming Contest arranged locally at university. | <i>Bangladesh</i> |
| 2017 | Learned Web design and Web development from JobsBD besides undergrad studies. | <i>Bangladesh</i> |
| 2010 | Member of Sylhet Cadet College Soccer team. (4th in 2010, ICCFM) | <i>Bangladesh</i> |