Md **Raihan** Ahmed

Software Engineer · Security Expert

Salt Lake City, Utah, USA

✉ u1374605@utah.edu | 🏠 mdrahmed.github.io | 🐙 mdrahmed | 💼 mdrahmed | 🐦 @MRA20014771

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

Education

University of Utah	*Utah, USA*
Ph.D. in Computer Science, **GPA: 3.86**	*Aug. 2021 - PRESENT*
University of Utah	*Utah, USA*
MS. in Computer Science, **GPA: 3.86**	*Aug. 2021 - May 2024*

Skills

Programming Lang.	Python, C/C++, Javascript, React.js, Node.JS, C#, JAVA, PHP, Typescript, Go, Scala, 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, Angular, Node.js, Express.js, DOM, 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,html, CSS, bootstrap, NixOS, Ubuntu, Kali Linux, macOS
Languages	English, Bangla, Hindi, Urdu

Experience

University of Utah	*Utah, USA*
Research Assistant	*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	*Utah, USA*
Teaching Assistant	

- 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 to showcase my skills with react.js.

Interactive Visualization tool
Javascript
DATA VISUALIZATION COURSE   *GitHub*   *Aug. 2022 - Dec. 2022*
- Built website with javascript to explore video game sales by year and platform.

Fuzzing XPDF-4.05
LLVM, C++
APPLIED S/W SECURITY TEST. COURSE   *Git1   Git2*   *Aug. 2022 - Dec. 2022*
- Discovered Critical bugs with fuzzy tool AFL++ in XPDF and reported it to developers

Rollback attack in Cars
Arduino, C++
CYBER-PHYS SYS & IOT SECURITY COURSE   *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)
Utah, USA
CONTEXT-AWARE INTRUSION DETECTION IN INDUSTRIAL CONTROL SYSTEMS   *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
Bangladesh
OVARIAN CANCER SUBSTANTIAL RISK FACTOR ANALYSIS BY MACHINE LEARNING: A LOW INCOMING COUNTRY   *paper   Jul. 2020*
- Analyzed ovarian cancer data using various machine learning algorithms to identify significant risk factors

BMC bioinformatics
Bangladesh
MACHINE LEARNING TO REVEAL AN ASTUTE RISK PREDICTIVE FRAMEWORK FOR GYNECOLOGIC CANCER AND ITS IMPACT ON WOMEN PSYCHOLOGY: BANGLADESHI PERSPECTIVE   *GitHub   paper   Apr. 2021*
- 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)
Bangladesh
A COMPARATIVE ANALYSIS OF TRADITIONAL AND MODERN DATA COMPRESSION SCHEMES FOR LARGE MULTIDIMENSIONAL EXTENDIBLE ARRAY   *paper   Feb. 2019*
- 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
Bangladesh
A BIOINFORMATICS APPROACH FOR IDENTIFICATION OF THE CORE ONTOLOGIES AND SIGNATURE GENES OF PULMONARY DISEASE AND ASSOCIATED DISEASES   *paper   Jul. 2020*
- 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
Bangladesh
PROTEIN INTERACTION NETWORK AND DRUG DESIGN OF STOMACH CANCER AND ASSOCIATED DISEASE: A BIOINFORMATICS APPROACH   *paper   Dec. 2020*
- Identified common genes among seven diseases (OB, SC, CC, PC, PRC, LK, MD) to analyze their biological and genetic network.

Extracurricular & Honors

DOMESTIC   Following shows my leadership & communications skills

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

INTERNATIONAL

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