Md **Raihan** Ahmed

SOFTWARE ENGINEER · SECURITY EXPERT

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"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*

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*

- Created a instrumentation tool with LLVM to trace back to the source of attack.
- 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

IEEE/IFIP International Conference on Dependable Systems and Networks *Naples, Italy*

ICSTRACKER: BACKTRACKING INTRUSIONS IN MODERN INDUSTRIAL CONTROL SYSTEMS (**1ST AUTHOR**) *paper* *Apr. 2025*

- Recovered program semantics, reconstructed data dependencies, and linked controller operations to OS- level events to show the cyber-physical attacks in ICS/CPS setting.

Re-design Industrial Control Systems with Security (RICSS)
Utah, USA

Context-Aware Intrusion Detection in Industrial Control Systems (1st Author)
paper   *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 (1st)
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 (B.Sc Proj, 2nd Author)
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 (5th Author)
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 (2nd Author)
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 (1st Author)
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

Year		Location
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

Year		Location
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*

Skills

Dev. & Deployment Tools	LLVM Compiler Tools, GitHub, Docker
Programming Lang.	Python, C/C++, Javascript, C#, JAVA, PHP, Perl
Frameworks	React.js, Node.js, Express.js, Android Studio, Dot(.) Net
Data Science & ML	Tensorflow, NumPy, scikit-learn, Pandas, Matplotlib
Database	Oracle SQL, MySQL
Data Mining & Visualization Tools	gSpan, PrefixSpan, Graphviz
Data Analysis Software	Matlab, Google Colab, Jupyter, Anaconda
Softwares Used	Neovim, tmux, vim, vs code
Interests	Security, Privacy, Machine learning, Artificial Intelligence