

# Md Raihan Ahmed

SOFTWARE ENGINEER · SECURITY EXPERT

Salt Lake City, Utah, USA

✉ u1374605@utah.edu | 🏠 mdrahmed.github.io | 📧 mdrahmed | 🌐 mdrahmed

“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

## Experience

### Meta

SOFTWARE ENGINEER INTERN

Menlo Park, California, USA

May 2025 - Aug. 2025

- To automate the asset classification using machine learning models because it takes months to come up with a good aggregation process
- Built multiple machine learning models, then compared those and deployed the best model to automate the asset classification.

### 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

- 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

GitHub paper Apr. 2021

IMPACT ON WOMEN PSYCHOLOGY: BANGLADESHI PERSPECTIVE (B.Sc PROJ, 2ND AUTHOR)

- 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

paper Feb. 2019

MULTIDIMENSIONAL EXTENDIBLE ARRAY (5TH AUTHOR)

- 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

paper Jul. 2020

PULMONARY DISEASE AND ASSOCIATED DISEASES (2ND AUTHOR)

- 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

paper Dec. 2020

BIOINFORMATICS APPROACH (1ST AUTHOR)

- 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

## 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