JAINTA PAUL

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Salt Lake City, USA
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Education

Ph.D. Student
Kahlert School of Computing, University of Utah
Security, Safety, and Privacy of Cyber Physical Systems January 2024 - Present

Bachelor of Science
Computer Science and Engineering
Bangladesh University of Engineering and Technology (BUET) February 2017 - May 2022

Higher Secondary Certificate(Science Track)
Notre Dame College August 2014 - June 2016

Publications

- **[The 17th NASA Formal Methods Symposium (NFM2025)]** HyTwin: Hybrid Program Semantics for Digital Twin-based Security Interventions in Industrial Control Systems
  ***Jainta Paul**, Stefan Mitsch, and Luis Garcia*

- **[CCS-RICSS'24]** Towards Cross-Physical-Domain Threat Inference for Industrial Control System Defense Adaptation
  ***Jainta Paul**, Lawrence Ponce, Mu Zhang, and Luis Garcia*
  In The 2nd International Workshop on Re-design Industrial Control Systems with Security (RICSS), co-located with The 31st ACM Conference on Computer and Communications Security (CCS), Salt Lake City, Utah, October 2024.
- **[The 55th Annual IEEE/IFIP International Conference on Dependable Systems and Networks (DSN)]** ICSTRACKER: Backtracking Intrusions in Modern Industrial Control Systems
  *Md Raihan Ahmed, **Jainta Paul**, Levi Li, Luis Garcia, and Mu Zhang*

Ongoing Research Projects

- **Listening Without Hearing: Unmasking Privacy Risks in On-Sensor Machine Learning**
  Investigating privacy vulnerabilities and data leakage risks in machine learning models operating directly on sensor hardware at the edge.
  ***Jainta Paul**, Miles Bovero, Pratik Soni, Luis Garcia*

Professional Experience

Software Engineer, OpenRefactory, Inc. June 2022 – November 2023

- **Test Drive – OpenRefactory (Technical Leader)** Led the development of a web platform for initiating static code analysis trials on open-source projects. Implemented GitHub authentication, repository selection, and multi-language analysis support (Python, Java, Go).

- **Open Source Python and Java Projects – Bug Analysis and Reporting (Full Stack Developer & Security Engineer)** Performed static analysis to detect security and compliance bugs in open-source Python and Java projects. Automated bug reporting workflows to notify maintainers.
- **Intelligent Code Repair (iCR)** Enhanced the Java static bug detection engine by implementing call graph construction, points-to analysis, and static taint analysis to support automated code repair.

Skills

Programming	Java, Python, C/C++, Structured Text (IEC 61131-3), JavaScript, SQL, Torch, CUDA
Security & Analysis	Industrial Control System Security, Cyber-Physical Systems Security, Threat Modeling, Provenance Analysis, Cross-Domain Causality Tracking, Vulnerability Assessment, Static Taint Analysis
Formal Methods	Differential Dynamic Logic (dL), Formal Verification of CPS, Safety Property Specification, ModelPlex Runtime Monitoring
Tools & Frameworks	Git, Docker, Linux, Kubernetes
Other Skills	Technical Leadership, Research Mentoring, Academic Writing, Public Speaking

Extracurricular Activities

- **Research Mentor**, University of Utah Research Experience for Undergrads (REU, Summer 2024)
- **Artifact Evaluation Committee**, ACSAC 2025
- Mentored undergraduate students in research, leading to a peer-reviewed publication co-authored with a mentee.
- Capture the Flag (CTF) Participation, **iTrust SUTD (2024)**.
- Served on the Organizing Committee, BUET CSE FEST 2018.

Honors and Rewards

- Graduate Tuition and Research Scholarship, University of Utah(Summer 2025)
- University Admission Scholarship 2016, BUET
- Merit Scholarship, Dhaka Education Board (2009, 2017)