

# Sajib Talukder, MSc Candidate

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## Research Interest

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Cybersecurity, Cyber Physical Systems, Artificial Intelligence, Autonomous Systems, Software Engineering

## Summary

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Research-oriented professional with hands-on experience as a data scientist and programmer across both academic and industry settings. Proven ability to contribute to complex projects through systematic investigation, critical thinking, and collaborative problem-solving. Skilled in designing reliable and maintainable systems that support long-term research objectives. Actively engaged in interdisciplinary collaborations, bridging technical and domain-specific knowledge to address real-world challenges. Committed to scholarly growth, meaningful research contributions, and the pursuit of advanced study as a Ph.D. student.

## Education

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**The George Washington University, Washington DC**

**August, 2023 – December, 2025**

*Master of Science in CEE(Transportation Engineering)*

**Khulna University of Engineering and Technology, Bangladesh**

**February, 2017 – April, 2022**

*Bachelor of Science in Computer Science and Engineering*

## Work Experience

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**Graduate Research Assistant**

**September, 2023 – Present**

*The George Washington University*

*Washington, DC*

- Developing an AI-powered cost estimation tool, improving workflow efficiency by 40% across diverse construction domains (Architecture, Electrical, etc.)
- Contributed to a sensor fusion system integrating Camera, PPG sensor, and OBD scanner for in-vehicle driver distraction detection and in-room health monitoring
- Conducting research on Edge Computing and real-time health event detection using MediaPipe FaceMesh for low-latency facial behavior analysis

**Software Engineer**

**July 2021 – August 2023**

*Shohoz Limited*

*Dhaka, Bangladesh*

- Led development of Bangladesh Railway's official ticketing app *RailSheba*, serving over 1 million users nationwide
- Designed and developed secure, high-performance web and cross-platform applications, reducing load times by 30%
- Built Single Page Applications and Progressive Web Apps with robust state management (Store/Redux), deployed on both Android and iOS platforms

**International Graduate Intern**

**August 2022 – December 2022**

*Kent State University - ATR Lab*

*Ohio, USA*

- Collaborated remotely with a research team to develop *Smart Trashcan Jr.*, an AI-based waste management system
- Enhanced Android application with Generative AI to provide users with contextual information about trash types, and integrated YOLO-based face identification to personalize user interaction
- Developed and trained a machine learning model to classify waste types with over 90% accuracy

**Project Based Software Consultant**

**December 2019 – March 2020**

*Bangladesh Navy Comflot West*

*Mongla, Khulna*

- Architected and delivered integrated software solutions for Bangladesh Navy operations, designing scalable database systems and communication protocols that automated manual workflows and enhanced operational efficiency across naval departments
- Led cross-functional collaboration with military personnel to analyze complex operational requirements, translate specifications into technical solutions, and implement hardware-software integration projects that streamlined mission-critical processes

## Selected Papers

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- \* Nur Imtiazul Haque, **Sajib Talukder**, Mohammad Ashiqur Rahman, Selcuk Uluagac and Laurent Njilla, "STRENGTH: A Graph Theory-Based Attack Analysis Approach for Security and Robustness Assessment of Smart Home Systems" Submitted to **41st Annual Computer Security Applications Conference, ACSAC 2025**
- \* **Sajib Talukder**, Nur Imtiazul Haque, Khandakar Ashrafi Akbar, "SPARE: Securing Progressive Web Applications Against Unauthorized Replications", Available at ARXIV: <https://arxiv.org/pdf/2508.07053>.

## Selected Projects

### RailSheba – Bangladesh Railway’s Online Ticketing App | [Play Store](#)

- Led development of Bangladesh Railway’s national ticketing app (1M+ users, 10k+ reviews, 4.0+ rating)
- Modernized legacy system by decoupling frontend from monolith and implementing SPA with Angular, Redux, PWA, and Service Worker
- **Used Frameworks/tools:** Angular, PWA, TWA, Store, Service Worker, Tailwind CSS, GAnalytics

### AllianceAI – AI-Powered Cost Estimation Tool

- Developing computer vision based cost estimation tool accelerates takeoff workflows by 35% through automated object detection
- Automated length measurement of walls, pipes, etc, through computer vision techniques, intuitive drawing tools across 1000+ construction elements
- **Used Frameworks/tools:** PyQt5, OpenCV, Yolo, Computer Vision, Roboflow

### MomentAI – Real-Time Health Event Detection System

- Designed a system detecting health anomalies with 83%+ accuracy using OpenCV, MediaPipe, and YOLOv8
- Delivered personalized feedback via Generative AI
- **Used Frameworks/tools:** PyQt5, OpenCV, Yolo, Computer Vision, Roboflow

### Traditional Snake Game | [Play Link](#) | [GitHub](#)

- Created an Angular-based web Snake Game, Applied Game Theory mechanics to enhance player engagement, with real-time leaderboard
- **Used Frameworks/tools:** Angular, Game Theory, HTML,CSS, Firebase

### Autonomous Driving Simulation | [GitHub](#)

- Genetic Algorithm (NeuroEvolution of Augmenting Topologies) based simulation to train simulated cars to follow path and move automatically.
- **Used Frameworks/tools:** Python, NEAT, Neural Network, PyGame

### ICE Hockey | [GitHub](#)

- A single-player Game where the AI agent is controlled by Finite State Machine
- **Used Frameworks/tools:** AI, Game Theory, Python

## Technical Skills

Languages	C++, Python, TypeScript, Java, JavaScript, C#
Frameworks	Angular, Flask, Node.js
Web Technologies	HTML5, CSS3, Tailwind CSS, ES6, Service Worker, PWA
Databases	MySQL, SQLite, MongoDB
Tools & Others	Git, PyQt5, YOLO, Computer Vision, RoboFlow

## Sports Programming Experience

- Solved 800+ programming problems across multiple competitive platforms.
- **LeetCode:** [staluk](#) – 190+ problems solved.
- **Codeforces:** [SajibTalukder](#) – 300+ problems solved.
- **LightOJ:** [sajib\\_talukde](#) – 120+ problems solved.
- **UVa Online Judge:** [staluk](#) – 50+ problems solved.

## Volunteering and Conference Experience

- Attendee, 104th TRB Annual Meeting 2025, Washington D.C.
- Attendee, 103rd TRB Annual Meeting 2024, Washington D.C.
- Participant, BACS (Bangladesh Advanced Computing Society) Regional Programming Camp 2017
- Volunteer, BitFest 2019 – 2nd CSE Fest, Khulna University of Engineering & Technology