

MD. Ismail Hossain

SOFTWARE ENGINEER · RESEARCHER · PROBLEM SOLVER

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Research Interest: Deep Learning, Machine Learning, Natural Language Processing, Cyber Security

Qualification Highlights

- **Academic Foundation:** B.Sc. in Computer Science & Engineering (GPA/Honors: 3.57 (5th)), providing a strong theoretical foundation in algorithms, system design, and distributed computing.
- **Innovation & Patent Holder:** Inventor and Co-Holder of Two Patents (Samsung Electronics), recognized globally for pioneering solutions in **wearable technology, real-time audio adaptation, and emergency response systems**
- **AI and Machine Learning Expertise:** Possesses **expert and hands-on experience** in developing and deploying **AI and Machine Learning models**, applying advanced techniques for real-time data analysis and complex pattern recognition.
- **Expert Mobile Architecture:** Software Engineer at Samsung R&D, proficient in developing **high-performance, low-latency** native applications (**Kotlin, Java, Swift, Objective-C**) for embedded and mobile platforms.
- **System-Level Optimization:** Proven skill in **system-level optimization** techniques, focusing on critical **power consumption and memory efficiency** challenges in constrained mobile and IoT environments.
- Skilled in implementing MVVM, MVP, and clean Architecture to ensure maintainable and scalable codebase
- **Algorithmic Aptitude:** Exceptional **Problem-Solving Ability** demonstrated by competitive programming success (ICPC participant) and mastery of over **1000 algorithmic problems** across leading platforms (**Codeforces, LeetCode, HackerRank, etc.**).
- **Leadership & Mentorship:** Demonstrated capability in **Technical Mentorship** (guiding junior engineers) and **Collaborative Leadership** through cross-functional project coordination.

Education

University of Rajshahi

Rajshahi, Bangladesh

Bachelor of Science- Computer Science & Engineering

Jan. 2015 – Apr. 2019

CGPA: 3.57 out of 4.00 (5th position)

Thesis: Bigmart Data Analysis (hypothesis generation, data exploration, data cleaning, feature engineering, and model building)

Notre Dame College

Dhaka, Bangladesh

Higher Secondary Certificate- Science Group

July 2011 - Aug. 2013

GPA: 5.00 out of 5.00 (Govt. scholarship with position 492)

Pabna Zilla School

Pabna, Bangladesh

Secondary School Certificate- Science Group

Jan. 2009 - May 2011

GPA: 5.00 out of 5.00 (Govt. scholarship with position 46)

Research Experience

1. TWS Mono to Stereo Mode Auto-Switching

- Invented and patented a True Wireless Stereo (TWS) technology that enables automatic switching between mono and stereo modes based on the position of earbuds, ensuring a seamless and comfortable user experience
- Focused on optimizing user convenience through intelligent detection mechanisms and real-time audio adaptation

- Contributed to advancing TWS technology by addressing common user challenges in audio device ergonomics

2. Emergency Chatbot for Battery-Efficient Personal Emergency Response System

- Designed and patented an innovative emergency chatbot that activates when the host device detects an emergency mode, ensuring real-time bi-directional communication with emergency responders.
- Focused on optimizing power efficiency, allowing prolonged device operation during critical situations.
- Contributed to enhancing personal safety and emergency response systems through advanced battery-efficient algorithms and reliable communication frameworks.

3. Smart Trainer for Gait Analysis

- Developed a smart trainer system utilizing accelerometer and gyroscope data from body-mounted sensors to analyze user movements.
- Implemented machine learning algorithms to classify and provide feedback on walking and running posture, ensuring high precision and accuracy in gait recognition and real-time analysis.
- Focused on enhancing user performance and reducing the risk of injuries through personalized movement insights.

4. Network Intrusion Detection

- Developed a novel approach to network intrusion detection by integrating hybrid sampling techniques with machine learning algorithms to improve detection accuracy and mitigate security threats.
- Designed, trained, and evaluated classification models capable of identifying malicious network activities with high precision and recall.
- Contributed to advancing cybersecurity by leveraging innovative data preprocessing and algorithmic strategies.

Technical Skills

Programming Language	Java, Kotlin, Swift, Objective-C, Python, C++
Problem Solving	Solved over 1,000 problems across various online judges; actively participated in ICPC and NCPC contests.
Design and Principles	Design Patterns: Creational (Factory, Singleton), Structural (Adapter, Decorator), Behavioral (Observer, Strategy); Principles : SOLID, DRY, KISS.
Algorithm Expertise	Dynamic Programming, Graph Theory, Number Theory
Machine Learning Tools	Tools : TensorFlow, Keras, PyTorch, Pandas, Scikit-learn.
Development Tools	Android Studio, Xcode, VS Code.
Mobile Development	Architectural Patterns : MVC, MVP, and MVVM (Android); VIPER (iOS) for robust and dynamic application architecture.
Agile Methodologies	Scrum, Kanban, and Sprint Planning.
Hardware	Raspberry Pi, Arduino
Version Controlling	Git, including branching and merging strategies.
Operating System	Windows, Linux, Mac

Work Experience

Samsung R&D Institute Bangladesh, Samsung Electronics

Dhaka, Bangladesh

Software Engineer

June 2019 – Ongoing

- **Engineered** high-performance, native mobile applications across **iOS and Android** platforms, utilizing **Java, Kotlin, Swift, and Objective-C** to ensure seamless, cross-platform user experiences.

- **Architected and developed** the foundational **Universal Wearable Connection and Protocol SDK** for all Samsung RTOS devices (e.g., **Smart Ring, Fit3**, and future iterations), standardizing device communication.
- **Developed** a high-efficiency data converter for the **Type-Length-Value (TLV)** protocol, accurately converting low-level **byte array** streams into structured, actionable data for real-time processing.
- **Drove** core feature development for flagship products, including the **Samsung Galaxy Fit 3, Smart Ring, and Galaxy Watch 8**, specializing in advanced connectivity protocols and user-centric features.
- **Pioneered** the design and implementation of the **Emergency SOS** system for wearable devices, integrating real-time location tracking and immediate communication for critical situations.
- **Designed and deployed** the "Find My Device" feature across the entire Samsung wearable product line (**Watch, Ring, Fit3, and Glass**).
- **Executed rigorous optimization** strategies for application logic, significantly reducing **memory footprint and overall power consumption** across multiple device generations.
- **Optimized** application performance and diagnosed technical bottlenecks using advanced profiling tools, including the **Android Profiler**, ensuring market-leading efficiency.
- **Implemented** complex architectural patterns (**MVC, MVVM, MVP, and Clean Architecture**) to enhance code quality, maintainability, and large-scale project scalability.
- **Awarded Two Patents (Granted)** by Samsung Electronics for key innovations in **True Wireless Stereo (TWS)** technology and the **Emergency Chatbot** system.
- **Managed** project delivery and guaranteed long-term stability by establishing robust **Continuous Integration (CI)** pipelines to streamline release and maintenance cycles.

Volunteer Experience: Academic Leadership & Mentorship

Rajshahi University IT Society

Rajshahi, Bangladesh

Communication Secretary

Feb 2015 – Jan. 2017

- **Managed** all external and internal communications for the Society, facilitating crucial technical partnerships with external organizations and extending the technical reach to over **650 student members**.
- **Oversaw and co-developed** the curriculum for an intensive **Android application development training** program (in collaboration with the **Google Developer Group (GDG)**), successfully educating a cohort of over **330** participants in modern mobile principles.
- **Designed and delivered** advanced technical workshops on foundational **Data Structures and Algorithms (DSA)**, serving as a technical mentor for junior cohorts preparing for the **ICPC** (International Collegiate Programming Contest).
- **Led the organization and execution** of two annual, highly competitive intra-department programming contests, fostering competitive coding excellence and engaging over **200** student participants.

Additional Leadership & Technical Mentorship (Samsung)

Samsung R&D Institute Bangladesh, Samsung Electronics

Dhaka, Bangladesh

June 2019 – Ongoing

- **Pioneered** internal knowledge transfer by **designing and delivering** specialized, hands-on workshops on **Applied Artificial Intelligence (AI)** principles, preparing peers for integration of advanced models into consumer features.
- **Provided targeted technical mentorship** to junior engineers, focusing on strengthening their foundational knowledge in **Data Structures, Algorithms (DSA)**, and efficient mobile feature implementation.
- **Guided and advised** team members through the high-level technical design and end-to-end development of critical, complex features, specifically the **Connection, Protocol, Converter, Find my, Emergency SOS** and **Out-of-Box Experience (OOBE)** functionalities.

- **Acted** as the primary point of contact and representative for the Team Lead during daily scrum meetings and in their absence, ensuring process adherence and seamless communication across the development cycle.

Achievements

2025 **Passed Machine Learning & AI Test**, *Samsung R&D*
2024 **Code Review Award**, *Samsung R&D*
2024 **Excellence in Software Certification Test Award**, *Samsung R&D*
2024 **Icon of the Month Award (March 24)**, *Samsung R&D*
2023 **CTO Award**, *Samsung R&D*
2023 **Passed Advanced & Professional Level Coding test**, *Samsung R&D*
2021 **Excellence in Innovation Award**, *Samsung R&D*
2020 **Excellence in Development Award**, *Samsung R&D*
2016 **NCPC regional programming contest**, *Rajshahi University*
2013 **Bangladesh Govt. Scholarship for H.S.C board examination**, *Notre Dame College*

Language Test

- IELTS Overall Score: 7.5 (L-9, W-7, S-6.5, R-7) Test taken - Nov 2024