**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

1. **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.

1. **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.

1. **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 330participants 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

 Developed and optimized **native mobile applications** for Android and iOS using Java, Kotlin, Swift, and Objective-C, delivering seamless cross-platform experiences.

 Architected the **Universal Wearable Connection & Protocol SDK** for Samsung RTOS devices (Smart Ring, Fit3, upcoming models), standardizing communication frameworks.

 Engineered a **Type-Length-Value (TLV) data converter** to transform raw byte streams into structured, real-time data for device communication.

 Contributed to **flagship wearable products** — Galaxy Fit3, Smart Ring, and Galaxy Watch8 — focusing on advanced connectivity and user experience features.

 **Designed and implemented the Emergency SOS system**, integrating real-time location and communication for critical situations.

 Built and deployed the **Find My Device** feature across the Samsung wearable lineup (Watch, Ring, Fit3, Glass).

 Executed **system-level optimization** strategies, reducing power usage and memory footprint across multiple product generations.

 Leveraged **Android Profiler** and related tools to identify and resolve performance bottlenecks, enhancing system efficiency.

 Implemented scalable **architectural patterns** (MVC, MVVM, MVP, Clean Architecture) to ensure maintainable and modular codebases.

 Awarded **two granted patents** by Samsung Electronics for innovations in **TWS (True Wireless Stereo)** and **Emergency Chatbot systems**.

 Established **Continuous Integration (CI) pipelines**, improving release stability and streamlining development cycles.

 Led **AI and ML workshops** to train peers on integrating intelligent features into consumer devices.

 Mentored junior engineers on **Data Structures, Algorithms, and mobile system architecture**, enhancing team capability.

 Guided the design and development of critical features — **Connection, Protocol, Converter, Find My, Emergency SOS**, and **OOBE**.

 Served as **acting representative for the Team Lead**, ensuring effective communication and delivery during development cycles.