K. M. Abesh Ahsan

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Education

Islamic University of Technology (IUT) Jun 2021 – October 2025
Bachelor of Science in Computer Science and Engineering (CSE) Gazipur, Bangladesh
CGPA: 3.72/4.0

Research & Thesis Work

Weakly Supervised Semantic Segmentation With Image Labels January 2024 – October 2025

Pioneered a transformer-based approach to enhance object detail understanding in weakly supervised segmentation. My work focused on improving class activation map (CAM) quality and fine-grained feature capture. I replaced traditional encoders like CLIP/ViT with **UniCL** using a **Swin Transformer**, enabling finer local feature extraction through windowed attention. I also experimented with multiple CAM generation and refinement methods, improving **affinity** calculations and leveraging encoder intermediate features. The model produced highly detailed masks for most classes, though performance on certain categories like *person, chair, potted-plant* reduced overall accuracy. Our approach achieved a mean IoU of **50%**, offering clear improvements in fine-grained segmentation, despite being lower than the **state-of-the-art** performance of **74%**.

Skills

Programming Languages: C, C++, Python, Java, C#, Dart, JavaScript, TypeScript, HTML, CSS, Bash, SQL

Frameworks and Libraries: Flutter, React, Next.js, Node.js, Express.js, JavaFX, PyQt6, Bootstrap, Tailwind, Material-UI

Tools and Technologies: Git, GitHub, Docker, Visual Studio, IntelliJ, Unity, JDBC
Databases: SQLite, MySQL, MongoDB

Experience

Battery Low Interactive – Game Development Trainee Oct 2024

During my industrial training as a Game Developer Trainee, I learned to design and build games from scratch using the Unity Engine and C#. I developed several mini-games to understand game mechanics, scoring systems, and physics-based interactions. For the final project, I created a 2D centrifugal-force game where players controlled a stone to hit targets, implementing game logic, score management, and interactive UI elements. I also worked with animations, assets, and scene design, and gained exposure to AR/VR concepts.

Programming Acheivements

IUT Intra First-Year Programming Contest 2021	**2021** — 1st out of 32 teams
CodeRush 1.0: Programming Competition	**2023** — 7th out of 37 teams

Projects

ChessDuel **2025** — Next.js, MongoDB, NextAuth, JWT, Socket.io, Redux Toolkit, Material-UI

Real-time Multiplayer Chess Platform — Developed with Next.js and TypeScript using an MVC-style architecture with Mongoose models, service layer, and API controllers. Implemented secure NextAuth OAuth authentication with strict email validation and JWT session checks. Designed for scalability, maintainability, and clean separation of concerns.

LeetVSCode **2025** — VS Code Extension API, Node.js, React.js, Tailwind CSS

An intelligent task management mobile app with a split-screen interface where the top half displays the visual todo list and the bottom half features a conversational chatbot. Features advanced NLU for natural voice command processing, SQLite database integration for persistent storage, and BLoC state management for real-time synchronization between voice interactions and visual updates.

Voice Reminder **2025** — Flutter, SQLite, BLoC, Speech Recognition, NLU

An intelligent task management mobile app with a split-screen interface where the top half displays the visual todo list and the bottom half features a conversational chatbot. Features advanced NLU for natural voice command processing, SQLite database integration for persistent storage, and BLoC state management for real-time synchronization between voice interactions and visual updates.

Photo Wizard **2024** — NumPy, PyQt6

A desktop app with image editing features including crop, resize, blur, sharpen, exposure, brightness, contrast, saturation, warmth, mirror, rotate, and filters. Supports custom filter creation. All processing implemented from scratch using NumPy, without OpenCV or PIL.

Tilawah **2024** — jQuery, JavaScript, Axios, EJS, Node.js, Express.js, MySQL

A single-page web application (SPA) for listening to Quran recitations from various Qaris. Features include seamless playback with resume support, search by Surah or Qari, favorites, playlist management, and live updates – all implemented using EJS and jQuery without modern frontend frameworks.