Mahbub Hasan Apu

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https://github.com/apu-eee-sec

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EDUCATION

- **Bachelor of Science** in **Electrical and Electronic Engineering (EEE).** *2020 - 2025*
  Institute: Sylhet Engineering College | **CGPA:** 3.91 out of 4.00
  Thesis: Optimized Approximate 8x8 Signed Multiplier Design for Low-Error FPGA Systems

SKILLS

Arduino ★★★★★	ESP 32 ★★★★☆	FPGA ★★★☆☆	C Language ★★★★☆	Python ★★★☆☆	Proteus ★★★★☆	PowerPoint ★★★★☆
Sketchware ★★★★☆	MATLAB ★★☆☆☆	Simulink ★★★★☆	AutoCAD ★★★★☆	SOLIDWORKS ★★★★☆	Excel ★★☆☆☆	Power BI ★★☆☆☆

PROFESSIONAL TRAINING

- **Training Institute for Chemical Industries (TICI), Narsingdi, Bangladesh.** *Jan 2024*
  Industrial Technology on Electrical Engineering & Instrumentation
  Obtained A+ grade and secured 1st Position in the training.
- **Single Phase Electrical Wiring and Installation** | Sylhet Engineering College. *2022*

MAJOR COURSES

- Very Large Scale Integration (VLSI).
- Microprocessor and Embedded Systems.
- Digital Signal Processing.
- Continuous Signals and Linear System.
- Digital Electronics.
- Power Electronics.
- Electronics I & II.
- Power System Protection.
- Power Plant Engineering.
- Power System I & II.
- Control System I.
- Communication I.
- Fundamentals of Biomedical Engineering.
- Electrical Properties of Materials

EXTRACURRICULAR ACTIVITIES

- Awarded 2nd Runner up in **"CAD WIZARD" segment at "HORIZON | A Vision To Support Lives"**. *2020*
- Awarded 2nd Runner up in **Technoventure 2.0 | Line Follower Robot** at Sylhet Engineering College. *2020*
- Participated in **Ignition 2023 National Mechanical Festival** segment of **"LFR"** *2023*
- Participated in **Robo Carnival 2024 – Industrial Line Tracker** Segment *2024*
- Participated in **First Technoxian Bangladesh | Line Following Robot**. *2024*
- Participated in **Technoventure 3.0 | Line Follower Robot**. *2024*
- Participated in **7th Bangladesh Chemistry Olympiad 2016**. *2016*

ACADEMIC PROJECTS

- **Three-Phase Inverter System using IGBT and Arduino**
  Designed and built a three-phase inverter that converts rectified DC from a three-phase AC supply into variable-frequency AC output using IGBT switching. Controlled inverter operation via Arduino-generated PWM signals with user interface through push buttons for start/stop and frequency adjustment. Suitable for applications such as variable frequency motor drives.
- **Real-Time Audio Analyzer using ESP32 and INMP441**
  Developed a real-time audio analysis system using an ESP32 and INMP441 MEMS microphone. The system calculates sound levels (dB), fundamental frequency, and other signal parameters, displaying results on an OLED screen. Integrated a button interface to switch between multiple data views, enabling interactive and educational sound monitoring.
- **AI-Powered Voice Assistant using ESP32 and Gemini API**
  Created an interactive Q&A system using ESP32 that communicates with Gemini AI via API to generate real-time responses to user queries entered through a serial monitor. Integrated text-to-speech functionality and audio playback using a MAX98357 amplifier, enabling spoken responses through a speaker for a complete voice assistant experience.
- **Smart Light Switch with Manual and Automatic Control**
  Designed a smart lighting system using Arduino that supports both manual and automatic brightness control. Manual mode uses a potentiometer and switch, while automatic mode adjusts light intensity based on ambient light (BH1750) and human presence (HC-SR04). A toggle switch enables mode selection, and a TRIAC controls light output for efficient power regulation.

ORGANIZATIONAL ACTIVITIES

- Served as **Instructor** at **SEC Robotics Club.** *Jan 2024 – Dec 2024*

ONLINE COURSES

- **Microsoft Excel Zero to Hero** | Udemy. *2022*
- **Introduction to Microsoft Excel** | Coursera. *2024*
- **VLSI System On Chip Design – Overview** | Maven Silicon. *2025*
- **Computer Vision with Embedded Machine Learning** | Coursera. *2025*
- **Master Class on Machine Learning** | Pantech Prolabs India Pvt Ltd. *2022*
- **First Python Program From UST** | Coursera. *2024*
- **Control Design Onramp with Simulink** | MATLAB Academy. *2024*
- **30 Days Webinar Participation on PLC, VFD, HMI** | Gobeshona Learning Academy. *2024*
- **Lighting Design with Dialux EVO** | Gobeshona Learning Academy. *2025*
- **Design Beautiful Animated Website** | Udemy. *2022*