Abu Bakkar Siddique Emon

abubakkar0001@std.uftb.ac.bd | +8801518979969
Linkedin | ResearchGate | Google Scholar | Github | abs-emon.github.io

Professional Summary

I am focused on applying my knowledge and skills in Artificial Intelligence, Machine Learning, Deep Learning, IoT, Robotics, Embedded systems, and Autonomous UAV development to contribute to real-world applications and research. Skilled in Python, AI Agentic Automation, MQTT, C, C++, Java, Unity, ROS2, Gazebo, RViz2, V-rep and PX4 for simulation and autonomous control. Experienced with Arduino, ESP32, Raspberry Pi, and Pixhawk hardware, and proficient in full-stack tools Laravel and Flutter. Passionate about integrating AI/ML to build intelligent, resource-efficient systems and exploring emerging technologies in UAVs, Aerospace, AI/ML, automation, and AR/VR applications.

Education

University of Frontier Technology, Bangladesh
B.Sc. in IoT and Robotics Engineering
(Current CG:3.50/4.0) Aug 2023 – May 2027 (Expected)
Nasirabad College, Mymensingh
H.S.C. (Science), GPA 5.00 Aug 2020 – Feb 2022
Monsurpur A.H.T High School, Netrokona
S.S.C. (Science), GPA 5.00 Jan 2018 – Feb 2020

Publications

1. A. B. S. Emon, S. Enam, "Autonoma: An Edge-AI Autonomous Obstacle Avoidance Mars Rover Prototype", (Manuscript submitted, under review)
DOI: Manuscript Pdf

2. A. B. S. Emon, S. Enam, L. Enam, "Health Monitor: A Hybrid Edge Cloud IoT Framework for Real Time Health Monitoring Using Stacked Ensemble Learning," (submitted, under review)in *2026 International Conference on Engineering and Frontier Technologies (ICEFronT)*, Mawlana Bhashani Science and Technology University,Tangail, Bangladesh, June 25-26, 2026, pp. 1–6.
DOI: Manuscript-final Pdf ©2026 IEEE

3. A. B. S. Emon, S. C. Das, A. Hasib, Md. Ashiqussalehin, "Aerobotics: A Low-Cost IoT-Based Real-Time Telemetry and Risk Prediction System for RC Aircraft Using ESP32 and Machine Learning," in *2025 28th International Conference on Computer and Information Technology (ICCIT)*, Cox's Bazar, Bangladesh, 2025, pp. 1–6.
DOI: 10.1109/ICCIT68739.2025.11491467 ©2025 IEEE)

Experience

Robot Simulation, UFTB June 2026 – Present

- Design and simulation of robotics system in physics-based simulator Gazibo, V-rep (CoppeliaSim), Rviz

- Mobile and non mobile Robot simulation, wall following robot simulation, humanoid robot simulation, Drone simulation, robotic arm pick and place simulation

Robotic Car Developments, UFTB April 2026 – Present

- Built Bluetooth Control Robotic Car, Sensor Control Autonomous Robotic Car, Autonomous Obstacle Avoidance Rover, Light Following Robot, Line Following Robot,
- Integrated Arduino(Uno,Nano), ESP32, Rassbery Pi 4B, Pi camera, Servo Motor, DC motor, Sensors, Relay Module

n8n AI Agent Automation Developer, UFTB Dec 2025 – Present

- Python-based Agentic Ai automation, Built diverse AI agents with n8n: SMS-based chat systems, social media automation, YouTube content upload agents, chatbots, and drone image analysis pipelines. AI-based news fact automation, AI-based social media content management, and online service automation.
- Integrated Hugging Face LLMs and Twilio API to deliver accessible AI via SMS for rural users without internet.
- Automated education, agriculture, and emergency workflows with the fastest responses, reducing digital divide barriers.

SU-27 RC Jet Development and Operator, UFTB Aug 2024 – Jun 2025

- Manually built, assembled, and tuned a lightweight RC SU-27 jet.
- Conducted test flights, integrated Pixhawk and Mission Planner for flight stabilization and telemetry.

Quadcopter Development & Operator, UFTB Aug 2024 – Jun 2025

- Designed and built a GPS-enabled quadcopter from scratch with responsive flight control.
- Integrated sensors, ESCs, and brushless motors for stable and precise flight operation.

Unity & VR Game Development, UFTB / TGG Organization Apr 2025 – May 2025

- Developed and published a 3D Car Racing Game, 2D Role-based Access Game, and XR Drone Simulator using Unity and C#.
- Built immersive simulations demonstrating game physics, object-oriented programming (OOP) principles, and interactive XR training.
- Released WebGL games and published the XR drone simulator on Itch.io.

Laravel & AI ChatBot Development (Japanese AI Course), TGG Organization Jan 2025 – May 2025

- Developed Laravel-based projects including Blog Web App, To-Do List, and AI-powered Chatbot with OpenAI API integration.
- Managed backend databases (MySQL) using HeidiSQL, TablePlus, and DB Engine; tested APIs with Postman.

Python Package Developer, UFTB Apr 2025 – Present

- Published a Python package named `emon` on PyPI.

Android App Developer, Amazon Appstore June 2024 – Dec 2024

- Published Online Tools, Calculator, and Namata apps.

- Integrated AdMob for monetization.

Web Developer, UFTB Robotics Club Jan 2024 – May 2024

- Designed and deployed secure, performance-optimized websites.

Projects

Social Media Automation with Ai July 2026
FB page Automation, groq Api, Meta Graph API, Goole cloud console

- A fully automated social media system where create and publish content automatically by Ai using the Groq API, reply to customers, and store data at Google Sheet.

Plant Disease Detector (Agronomy) July 2026
Android app, Java, TensorFlow Lite, deep learning model,CNN, YOLO

- Built an on-device multi-crop plant leaf disease detection app (Java, TensorFlow Lite, CameraX) supporting real-time and image-based inference across multiple crop models (rice, banana, tomato, etc.) with voice-assisted results.

PX4 x500 Drone Controlling with LLM in ROS2 Jazzy using Natural Language Command April 2026
PX4 x500 drone, QGroundController, ROS2 Jazzy, Gazebo, LLM, Micro-XRCE-DDS-Agent

- Running LLM on the local machine using prompt-based fine-tuning for Drone control, LLM API setup on the backend Python script, user input natural language command, LLM controls the Drone based on the user command in ROS2 Jazzy Gazebo simulation.

AI-Edge Autonomous Obstacles Abidance Mars Rover Prototype April 2026
Onboard CNN-VLM Image Validation and Rapid Textual Insight Transmission for Overcoming Communication Latency

- To design and develop an AI-edge autonomous Mars rover prototype that integrates autonomous obstacle avoidance
- onboard CNN-based image validation, tiny VLM image analysis
- prioritized textual insight transmission to overcome communication latency and bandwidth waste in deep-space exploration scenarios

AI-Based Personal Smart Voice Assistance Robot: Emma April 2026
NLP, Python, pyttsx3, LLM, Voice to Voice talking system

- To design and develop an AI-Based Personal Smart voice Assistance Robot: Emma, using a cardboard body
- Arduino control Servo to movements of the hand and face of the Emma Robot
- Response user with voice and movements of hand, head, and face expression

Arduino-Based Drone: A Low-Cost Drone Design and Development Using Arduino Uno April 2026
Arduino Uno, MPU6050 Gyroscope, Fly-Ski Fs i6

- To design and develop a low-cost drone using Arduino Uno
- Write the Flight Control Arduino code for channel setup, esc calibration, compass calibration, and flight Controller program code design for an easier-to-fly drone.

- low-cost equipment Arduino (main controller),mpu6050,BLDC motor, propeller, ESC 30A, Fly Sky Fs i6 transmitter, body frame

SMS-based AI Chat & Information System Jan 2026
Twilio, n8n, Hugging Face LLMs, Llama 3.2, OpneAi, Openrouter

- Created SMS-driven AI platform routing queries to specialized models for education, farming, health, and emergencies.
- Provided instant answers for math help, crop advice, weather, and disaster info — empowering rural students and farmers without smartphones or even internet.

Design and Development of a Multi-Service Drone for Disaster-Affected Areas with Wireless Power Transfer and Real-Time Data Analytics Capstone Project Feb 2026
Raspberry Pi, Pixhawk, VGG16, Llama 3.2 VLM, n8n, Ngrok

- Developed an affordable multi-service drone for disaster zones with WiFi restoration, Tesla coil WPT for swarm charging, and 300g emergency payload delivery
- Employed VGG16 for disaster type classification and Llama 3.2 Vision VLM for real-time scene description & damage assessment
- Built n8n workflow for auto-analysis upload to Facebook/website, air quality monitoring (with nuclear radiation), and Google Sheets logging — open-source via Raspberry Pi + Ngrok

Aerial UAV-Based Real-Time Air Quality Monitoring System Semester Project 2026
ESP8266, Low-Cost Sensors, n8n, LLM

- Designed drone-based air quality monitoring system using ESP8266, $PM_{2.5}$, DHT22, and MQ135 sensors
- Implemented real-time data collection, Wi-Fi transmission, and LLM-powered automated analysis via n8n
- Generated AQI reports, pollution hotspot maps, and health risk assessments stored in Google Sheets

Quadcopter Drone Development November 2025 – Present
Pixhawk, Mission Planner

- Designed a GPS-enabled quadcopter with responsive flight control.

RC Plane GPS Telemetry System september 2025 – Present
Pixhawk, Mission Planner, MAVLink

- Integrated real-time GPS telemetry with RC aircraft for remote monitoring.
- Visualized flight data via telemetry modules and analyzed performance.

Drone Simulator XR(Extended Reality) Project May 2025 – Present
Unity, C#, Flight Physics

- Developed an immersive XR drone simulator for training, published on Itch.io.
- Designed a flight simulator replicating real-world quadcopter dynamics.
- Implemented PID-tuned flight control and mission simulation environments.

AI-Powered Chatbot Web App (Japanese AI Course) Mar 2025 – May 2025
Laravel, PHP, MySQL, Tailwind CSS, OpenAI API

- Integrated AI-powered chatbot with voice-to-text, text-to-voice, and AI image generation.

- Managed backend databases using HeidiSQL, TablePlus, and DB Engine; tested APIs via Postman.

Laravel To-Do List Web App Feb 2025 – Apr 2025
Laravel, PHP, MySQL, Tailwind CSS

- Created a task management app with CRUD operations and responsive UI using Tailwind CSS.

Laravel Blog Web App Jan 2025 – Mar 2025
Laravel, PHP, MySQL, Tailwind CSS

- Developed a blogging platform with full CRUD functionality, user authentication, and responsive design.

2D Game with Role-based Access Apr 2025 – May 2025
Unity, C#

- Implemented role-based access using polymorphism to demonstrate OOP concepts.

IoT-based Health Monitoring System May 2025 – Present
ESP32, Firebase, IoT Dashboard

- Built an ESP32-based system to monitor heart rate and temperature remotely.
- Visualized real-time data in Firebase dashboard and triggered alerts.

3D Car Racing Game May 2025 – Present
Unity Engine, C#

- Custom vehicle dynamics, terrain, camera, and controls.

Sign Language Detection Jan 2025 – Present
Python, TensorFlow, OpenCV

- Implemented ASL sign detection system using ML and OpenCV.

School Management System Aug 2024 – Dec 2024
HTML, CSS, PHP, MySQL

- Full-stack web app for school operations.

Student Expense Tracker App October 2025 – Present

- A Flutter-based Android app with a PHP backend and MySql Database for students' expense tracking.

Online Store Jan 2025 – Present

- Customized Amazon-style e-commerce with Blogger and JS.

Snake Game Jan 2024 – Present

- Write a snake game program using Structure Programming C language logic as a sessional Course lab final project.

Technical Skills

Languages: Python, C, C++, Java, PHP, SQL, C#, Dart
ML Frameworks: NumPy, Pandas, Matplotlib, TensorFlow, Scikit-learn
App: Java, Flutter, Kotlin, Android Studio

Web: HTML, CSS, JavaScript, FastAPI, PHP, Laravel, MySQL, WordPress
Tools: VS Code, PyCharm, Unity, Arduino, ESP32, Pixhawk,raspberry pi, Mission Planner
Others: n8n ai agent, ROS2 (rviz2, Gazebo), OpenCV, Git, Blender, Cisco Packet Tracer

Training

AI for Immersive Technology (BDSET) October 2025 – Present
Kaliakoir Hi-Tech Park, Gazipur
AI/ML, Python, Deep Learning, AR/VR/MR/XR, Communicative English

- Gained hands-on experience in AI/ML model development and intelligent system design using Python.
- Learned immersive technology development with AR, VR, and MR using Unity 3D.
- Completed industry-focused training with advanced lab facilities and globally recognized certification.

Japanese AI Course (TGG Organization) Jan 2025 – Mar 2025
Laravel, PHP, MySQL, Tailwind CSS, OpenAI API

- Completed multiple Laravel-based projects including Blog Web App, To-Do List Web App, and AI-powered Chatbot.
- Gained hands-on experience with backend management tools (HeidiSQL, TablePlus) and API testing (Postman).

Japanese VR Course (TGG Organization) Apr 2025 – May 2025
Unity, C#

- Developed 3D Car Racing Game, 2D Game with Role-based Access, and XR Drone Simulator.
- Learned game physics, object-oriented programming (OOP), and immersive XR simulation.

Web Development Training (UYLab) Jan 2024 – May 2024
HTML, CSS, JavaScript, PHP, MySQL

- Learned full-stack web development and built secure, performance-optimized applications.

Leadership & Activities

Project and Workshop Secretary, UFTB Robotics Club 2025 – Present
Organized robotics workshops, project exhibitions, and technical training sessions to enhance members' practical skills.

Olympiad Coordinator, UFTB Math Squad Club 2025 – Present
Coordinated inter-university math olympiads and academic events, fostering collaboration and problem-solving excellence among participants.

Awards and Scholarships

Shaheed Syed Nazrul Islam Scholarship for HSC (2023)
15th National Undergraduate Math Olympiad Finalist (2024)

Student Robot Developement Fund 2025 (Robo Tech Valley)

Certifications

Python Basics, NASA Space App Challenge, Robotics Course, Machine Learning, AWS ML, Soft Skills, VS Code Udemy Certificate, Hackerrank Problem Solving, ML Specialty, AI Concepts Microsoft, Excel for Workplace, WordPress Theme UYLab, Math Olympiad Participation, Math Olympiad Achievement

References

Farzana Akter, Assistant Professor, Dept. of IRE, University of Frontier Technology, Bangladesh
Email: farzana0001@uftb.ac.bd
Saurav Chandra Das, Lecturer, IRE, University of Frontier Technology, Bangladesh
Email: saurav0001@uftb.ac.bd
Suman Saha, Chair, Dept. of IRE, University of Frontier Technology, Bangladesh
Email: suman0001@uftb.ac.bd
Md. Toukir Ahmed, Assistant Professor, Dept. of IRE, University of Frontier Technology, Bangladesh
Email: toukir0001@uftb.ac.bd