Kiyas Mahmud

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PROFILE

Computer Science undergraduate at American International University-Bangladesh with academic research experience in autonomous agents, multimodal learning, machine learning, and full-stack development. Conducting WebFARM thesis research on failure detection, adaptive recovery, and episodic memory in autonomous web agents. Contributed to papers accepted at IEEE TENCON 2026 and ICECCME 2026 and led award-winning AI and industry-collaboration projects.

EDUCATION

BSc in Computer Science | American International University-Bangladesh (AIUB), Dhaka — CGPA: 3.45/4.00 — December 2026

Higher Secondary Certificate (HSC), Science | Ideal College, Dhanmondi, Dhaka — GPA: 4.75/5.00 — 2021

Secondary School Certificate (SSC), Science | Singair Pilot Government High School, Manikganj — GPA: 4.94/5.00 — 2018

RESEARCH EXPERIENCE

Undergraduate Thesis: WebFARM | Lead Technical Researcher

WebFARM: A Multimodal Framework for Failure Detection, Adaptive Recovery and Episodic Memory in Autonomous Web Agents

Research Supervisor: Asst. Prof. Nuzhat Tabassum, Department of Computer Science, American International University-Bangladesh (AIUB)

- Led the technical research, including methodology and experimental design, framework architecture and implementation, model integration and evaluation, experiment execution, and results analysis for multimodal failure detection, adaptive recovery, and episodic memory in autonomous web agents.
- Developed and evaluated multimodal approaches using Qwen2-VL-2B, Qwen2.5-VL-7B, and InternVL3.5-8B on Web-Gold-40K, comprising 40,017 real-browser interaction steps.
- Preliminary experiments achieved a best F1 score of **0.839** and **93.49%** recovery prediction accuracy.
- Evaluated Browser Use and SeeAct agents across 22 websites and 42 tasks, observing task-completion improvements of 13.1 and 20.2 percentage points, respectively.

PUBLICATIONS

AutoTuneX: An Intelligent Self-Optimizing Runtime Framework for Cloud Applications

Accepted at IEEE TENCON 2026, Bali, Indonesia

- Designed a five-component closed-loop Kubernetes autoscaler; live Minikube experiments reported 72.2% lower cost, zero SLO violations, and zero scaling oscillations using Linear Regression.

Hybrid FraudShield: Detecting Financial Fraud in Real Time with Explainable AI

Accepted at ICECCME 2026, Bali, Indonesia

- Evaluated a stacking ensemble with Logistic Regression meta-learner on approximately 590,000 IEEE-CIS transactions: 98.7% accuracy, 0.978 ROC-AUC, and 8.1-point precision gain over XGBoost at equal recall; SHAP explanations under 500 ms.

Comparative Analysis of Heap Algorithms for Anomaly Localization in Dynamic Graph Neural Networks

Published in Atlantis Press, Proceedings of ICERIE 2025; available online 18 November 2025

- Compared Fibonacci, D-ary, and PriorityQueue heaps in Dijkstra's Algorithm for anomaly localization, examining efficiency, memory use, and scalability.

Real-Time Fusion of Behavioral and Transactional Data for Fraud Detection

Presented at ICASF 2025, Dubai

- Proposed an ensemble framework combining behavioral, transactional, and device-level data for real-time fraud detection.

PROFESSIONAL AND INDUSTRY EXPERIENCE

Sales Officer Copilot | AI-Powered Sales Management Platform

Industry Collaboration: Elite Group of Industries, Bangladesh

- Led the development of a Bangla and English sales app with GPS tracking, reporting, and live team monitoring.
- Built a secure backend with 540 API endpoints and integrated a Gemini-powered AI sales assistant.

Technologies: Python, FastAPI, Cloudflare Workers, Flutter, React, Gemini API.

Phonelot | Wholesale Mobile Phone POS

Client Project: Taslima Enterprise, Bangladesh | 2026

- Developed a Bangla and English sales system for phone inventory, orders, payments, and barcode scanning.
- Built a secure backend with inventory tracking, activity logs, backups, and 494 automated tests.

Technologies: Nuxt 4, TypeScript, Hono, Cloudflare D1, Tesseract.js, ZXing WASM.

Research Assistant | Tech Wing's Lab, Dhaka

January 2025 to March 2026

- Assisted with research planning, analysis, documentation, and research paper preparation.
- Reviewed academic papers and guided junior researchers in academic writing and research methods.

PROJECTS

ScholarNest | AI-Powered Scholarship Management Platform

- Developed an AI-powered scholarship platform with global discovery, application tracking, professor CRM, AI-personalized emails, and document review.
- Integrated automated follow-ups, deadline alerts, analytics, risk scoring, and secure document management.

Technologies: Nuxt 3, Vue.js, TypeScript, PostgreSQL, Prisma ORM, Redis, Gemini AI

Hybrid Fraud Shield | Explainable AI-Based Fraud Detection

- Developed a hybrid ML/DL fraud detection system combining XGBoost, CatBoost, CNN, and BiLSTM with ensemble learning for real-time transaction risk assessment.
- Integrated SHAP and Integrated Gradients for explainable predictions and implemented a FastAPI-based real-time inference service.

Technologies: Python, Scikit-learn, XGBoost, CatBoost, SHAP, FastAPI

HandyLaw | AI-Powered Legal Drafting Platform

- Developed an AI-assisted Bangla legal drafting platform with verified legal-source citations, structured case analysis, and mandatory advocate review and approval.
- Implemented secure AI authorization, Gemini output validation, sandboxed DOCX/PDF generation, and 2,400+ automated tests.

Technologies: TypeScript, Hono, Cloudflare Workers, D1, Nuxt 4, Gemini API, Zod, Vitest

TECHNICAL SKILLS AND RESEARCH INTERESTS

Research: Autonomous AI Agents, Multimodal Learning, Vision-Language Models, Trustworthy AI, Machine Learning, Explainable AI, Cloud Optimization

AI/ML: Scikit-learn, XGBoost, CatBoost, SHAP/TreeSHAP, Gemini API, Model Evaluation, Preprocessing, Ensemble/Stacking, Fraud Detection

Agentic Systems: Autonomous Web Agents, Failure Detection, Adaptive Recovery, Episodic Memory, AI Agent Integration

Programming: Python, C++, JavaScript, TypeScript, PHP, C#, Dart

Frameworks/Cloud: FastAPI, Flutter, React, Next.js, Vue, Nuxt 3/4, Laravel, Hono, SQLAlchemy, Drizzle ORM, Zod, PWA, Cloudflare Workers/D1/R2/Queues/Vectorize/AI Gateway, Docker

Data/Security/Tools: PostgreSQL, MySQL, SQL Server, Redis, RBAC, Biometric Authorization, Hardware-Backed Signatures, Audit Logging, Tesseract.js, ZXing WASM, LibreOffice, Poppler, Vitest, Automated API Testing, GitHub Actions, Git, Jupyter, Pandas, NumPy, Supervisely

COURSES AND CERTIFICATES

Machine Learning with Python | IBM/Coursera | **PHP and Laravel, Batch 2 |** OSTAD

HONORS AND AWARDS

Silver Medal | World Invention Competition & Exhibition Bangladesh (WICEBD), for ScholarNest

Winner | Bangladesh ICT & Innovation Awards 2025, for Hybrid Fraud Shield

Participant | Asia Pacific ICT Alliance (APICTA) Awards 2025, presented Hybrid Fraud Shield

LEADERSHIP & COMMUNITY ENGAGEMENT

Founder & Instructor | CodeSage

- Founded an independent educational platform and taught programming and technology courses to over 100 university students, providing technical mentorship and practical coding guidance.

Finance Head | Charity For Happiness

- Managed financial activities and supported charitable initiatives, including financial assistance, food distribution, winter clothing distribution, and direct on-field support for underprivileged communities.

Patrol Leader (Mate) | 6th National COMDECA

Bangladesh Scouts | Haimchar, Chandpur, Bangladesh | 2018

- Led a Scout patrol during the 6th National Community Development Camp, coordinating team logistics, disaster preparedness drills, and community service activities.

Sixer (Team Leader) | Manikganj District Cub Camporee

Bangladesh Scouts | Represented: Singair Pilot Primary School | 2007

- Led a six-member Cub Scout unit, coordinating camp logistics, team drills, and community service activities while developing early leadership and teamwork skills.

LANGUAGES

English: Fluent, professional working proficiency | **Bengali (Bangla):** Native

REFERENCES

Prof. Dr. Afroza Nahar

Professor, Department of Computer Science
American International University-Bangladesh (AIUB)
Email: afroza@aiub.edu

Asst. Prof. Nuzhat Tabassum

Assistant Professor, Department of Computer Science
American International University-Bangladesh (AIUB)
Undergraduate Thesis Supervisor, WebFARM
Email: nuzhat.tabassum@aiub.edu