UMMAY MAIMONA CHAMAN

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OBJECTIVE

AI and machine learning enthusiast with expertise in healthcare applications, medical image processing, multimodal learning, anomaly detection, and clinical prediction. Seeking opportunities in Web Development, Machine Learning, AI, or Research Engineering to apply technical skills toward building trustworthy, impactful solutions.

EDUCATION

BRAC University **Dhaka, Bangladesh**
Bachelor of Science in Computer Science and Engineering *2022 – 2026 (Expected)*

- **CGPA:** Ongoing
- **Relevant Coursework:** Machine Learning, Deep Learning, Neural Network, Computer Vision, Data Science, Algorithms and Data Structures, Microprocessors, Robotics, Web Development
- **Undergraduate Thesis:** *A twin-aware multimodal deep learning framework with optimized late fusion for early prediction of adolescent anxiety disorder. Under review at PLOS ONE.* Available as a preprint: medRxiv
- **Supervisor:** Dr. Md. Golam Rabiul Alam
- **Co-Supervisor:** Mr. Rafeed Rahman

Holy Cross College **Dhaka, Bangladesh**
Higher Secondary Certificate (HSC), Science *2019 – 2021*

- **GPA:** 5.00 / 5.00

Monipur High School and College **Dhaka, Bangladesh**
Secondary School Certificate (SSC), Science *2017 – 2019*

- **GPA:** 5.00 / 5.00

RESEARCH EXPERIENCE

Undergraduate Researcher **Jan 2024 – 2025**
Biomedical Science and Engineering Research Center (BIOSE), BRAC University *Dhaka, Bangladesh*

- Conducting AI-driven biomedical research in bioinformatics, computational biology, medical imaging, and disease diagnosis under faculty supervision.
- **Research Tools:** Familiar with literature review tools (Mendeley, Zotero), academic databases (IEEE Xplore, ACM Digital Library, PubMed), and citation management

Director **Sep 2023 – Feb 2026**
BRAC University Research for Development Club (BUReD) *Department : Research and Development*

- Leading research initiatives for undergraduate students, providing mentorship in research methodology, academic writing, and publication strategies.
- Organizing technical workshops, research seminars, and competitions to cultivate research culture and promote interdisciplinary collaboration.
- Contributed to paper compilation and manuscript preparation for *BURed Reflection Magazine* (Vol. 2 & 3). Authored two accepted articles currently in publication: *"Pixel Prowess and Peril: Navigating Security Challenges in AI-Driven Editing"* (**Chaman, U. M.**, Nazifa, A. P., 2026) and *"Turning the Tide: Rethinking Plastic Waste Management in Bangladesh"* (**Chaman, U. M.**, Rizve, A., 2026).

PUBLICATIONS & MANUSCRIPTS

- Taosif, M., **Chaman, U. M.**, Prova, N. A., Taher, S. M., Alam, M. G. R., & Rahman, R. A twin-aware multimodal deep learning framework with optimized late fusion for early prediction of adolescent anxiety disorder. *medRxiv.* [Preprint] **(Under Review at PLOS ONE).**
- Noor, A., **Chaman, U. M.**, & Kabir, M. S. Federated Learning in Healthcare: A Comprehensive Survey on Privacy, Scalability, and Clinical Applications. *ICT Express (Q1 Journal).* [Preprint] **(Under Review).**
- Rabbi, R., Siraj, F. M., Noor, A., Ahmed, Z., **Chaman, U. M.**, & Zereen, A. HARE: A Large-Scale Indoor RGB Video Dataset for Robust Fall Detection across Lighting Conditions. *KDD 2026 (Datasets & Benchmark Track, A* Conference).* **(Under Review).**

- Kabir, M. S., Noor, A., **Chaman, U. M.**, & Mehreen, N. Robust Multi-Backbone Hybrid Fusion for Chest X-Ray Pneumonia Detection. *QPAIN 2026 Conference*. [Preprint] **(Accepted).**
- **Chaman, U. M.**, Prova, N. A. Towards Responsible AI in AI-Enabled Visual Editing: A Framework for Fairness, Transparency, and Security. *IndabaX 2026 (PMLR, Scopus Indexed).* **(Under Review).**
- Warda Andalib, T., Hafiz, N., Disha, N. A., Alam Omey, F., Labby, A., **Chaman, U. M.** Smart Waste Solutions: Harnessing Technology for a Greener Future. *International Conference on Engineering, Management and Social Sciences 2024.* [Paper].
- **Chaman, U. M.** et al. Ray Emission by the Interaction of Cold Atmospheric Plasma with High Beam Energy Electron-Positron. *Beamline for Schools 2021 (CERN).* [Paper].

TECHNICAL PROJECTS

Software Projects

- **Multilingual RAG Chatbot: Document Intelligence System** | Python, FAISS, Tesseract OCR GitHub Demo
  Built a multilingual (Bengali, Banglish & English) RAG system for contextual Q&A over PDFs and images using OCR and semantic search.
- **ApneaSense** | Python, XGBoost, SHAP GitHub
  Developed an ensemble learning framework for sleep apnea risk stratification with SHAP-based explainability for clinically interpretable predictions.
- **FaceGuard** | PyTorch, MesoNet, Capsule Networks GitHub
  Built a multimodal deepfake detection system combining MesoNet and Capsule Networks with automated forensic reporting for robust media authenticity verification.
- **Unsupervised Neural Network Architectures** | Python, SOM, Autoencoders GitHub
  Implemented unsupervised models for pattern discovery in clinical datasets achieving 15% improvement over baseline clustering methods.
- **SkillPocket** | MERN Stack GitHub Demo
  Developed a full-stack skill-exchange platform with user management, scheduling, feedback, and request handling using React and Node.js MVC architecture.
- **CNN Vision** | TensorFlow.js, CNN, Grad-CAM GitHub Demo
  Created a browser-based deep learning workbench enabling real-time image classification, batch inference, and Grad-CAM explainability with client-side processing.
- **Consumer Churn Prediction** | Machine Learning, Scikit-learn GitHub
  Built classification models using Logistic Regression, Random Forest, and Gradient Boosting for customer retention analysis and data-driven insights.
- **Pharmacy Management System** | PHP, MySQL, HTML, CSS GitHub
  Designed a database-driven web system for pharmacy inventory, billing, and administration with dynamic frontend and backend integration.
- **SkinGuard** | PatchCore, PyTorch, Anomaly Detection GitHub
  Implemented a PatchCore-based anomaly detection pipeline for skin disease identification using image embeddings and nearest-neighbor search.
- **CurveMaker** | Python, Flask, SciPy GitHub Demo
  Built an interactive chart-generation web app with real-time previews, multiple curve types, and export support.
- **3D Racing Game** | PyOpenGL, Python GitHub
  Developed an endless car racing game with curved tracks, AI opponents, and dynamic obstacle management using PyOpenGL.

Hardware Projects

- **Digital Judging Platform** | Microcontroller GitHub
  Developed a role-based voting and scoring system with weighted evaluation, validation mechanisms, and automated result generation.
- **Smart Plant Watering System** | Autonomous Robot
  Built an autonomous irrigation system with plant detection, environmental sensing, and adaptive watering using embedded systems and custom navigation logic.
- **Autonomous Restroom Management System** | Arduino, IoT, Telegram API
  Developed an Arduino-based automation system for restroom monitoring with water leakage control, odor management, and real-time maintenance alerts via Telegram.

TECHNICAL SKILLS

Programming Languages: Python, JavaScript, C, C++, R, SQL, PHP
Machine Learning & AI: TensorFlow, PyTorch, Keras, Scikit-learn, OpenCV, Pandas, NumPy, SciPy, Matplotlib
Deep Learning Specialization: CNN, RNN, Transfer Learning, Anomaly Detection (PatchCore), Federated Learning, GradCAM, Computer Vision
Web Development: MERN Stack (MongoDB, Express.js, React, Node.js), HTML5, CSS3, Bootstrap, REST API, Flask, TensorFlow.js
Databases: MongoDB, MySQL, PostgreSQL, MariaDB
Robotics & Embedded Systems: Arduino, Raspberry Pi, STM32, Sensors, Microcontrollers, LTspice, PSpice, TinkerCAD
Development Tools: Git, GitHub, Jupyter Notebook, Google Colab, VS Code, LaTeX, Linux/Unix
Data Analysis & Visualization: Pandas, NumPy, Matplotlib, Seaborn, Plotly, SciPy
Design & Documentation: Adobe Photoshop, Illustrator, Canva, Microsoft Office Suite, Technical Writing

PROFESSIONAL TRAINING & CERTIFICATIONS

- **Machine Learning Fundamentals** — Simplilearn (Advanced ML code and Theory).
- **Introduction to Artificial Intelligence** — University of Helsinki (Comprehensive AI course).
- **Python Programming** — Kaggle, HackerRank (Advanced programming certifications).
- **JavaScript Foundations** — Cisco Networking Academy (Web development certification).
- **Cybersecurity Fundamentals** — IBM P-Tech (Security).
- **Prompt Engineering Basics** — Intellectium (AI interaction and optimization).
- **Robotics Basics** — BRAC University Robotics Club (Hands-on robotics training).
- **Digital Marketing Essentials** — Google Digital Garage (Marketing analytics).
- **HTML & Web Design** — BUP IEEE Women in Engineering (Frontend development).

ACADEMIC COMPETITIONS

- **Beamline for Schools 2021 (CERN)** — Participant; conducted physics research on plasma–beam interactions.
- **International Climate Science Olympiad 2021** — Participant; completed an on-site case study and authored a research paper addressing real-world climate challenges.
- **GOI Peace Foundation Essay Contest 2021** — Participated in an international essay competition focused on global issues and peace initiatives.
- **BRACU Programming Contest 2022** — Competed in an algorithmic problem-solving contest organized by BRAC University.
- **National High School Programming Contest 2021** — Participated in a national-level competitive programming contest.
- **National & International Olympiads** — Participated in Olympiads in Mathematics, Biology, Chemistry, Robotics, and related STEM disciplines.

HONORS & AWARDS

- **Bronze Award** — Duke of Edinburgh International Award Program (2023).
- **Bronze Award** — The Queen's Commonwealth Essay Competition, Senior Category (2021).
- **Pre-finalist** — International Astronomy and Astrophysics Competition (IAAC) (2022).
- **Pre-finalist** — International Youth Math Challenge (IYMC) (2021).
- **Silver Badge** — HackerRank