Reshad Ul Karim

Computer Science Undergraduate

An innovative Computer Science undergraduate with a robust foundation in AI. Demonstrates a proven track record through contributions to high-impact projects showcased at global competitions, and AI-based human analytics, computer vision and HCI research. Proficient in machine learning and programming, with a strong focus on advancing autonomous systems and delivering impactful AI-driven solutions.

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EDUCATION

BSc. in Computer Science and Engineering
BRAC University
09/2022 - Present   CGPA: 3.89/ 4.00

Higher Secondary Certificate
Notre Dame College, Dhaka
06/2019 - 02/2022   GPA: 5.00/5.00

Secondary School Certificate
Birshreshtha Noor Mohammad Public College
01/2008 - 05/2019   GPA: 5:00/5.00

WORK EXPERIENCE

Core team member - AI and autonomous systems
BRAC University Mars Rover Team - MONGOL TORI ⧉
01/2024 - 06/2025   *Dhaka, Bangladesh*
Achievements/Tasks
- Finalist in URC 2025 and URC 2024, ranking among the top 8 teams globally out of 102. Designed high-precision electronic circuits and PCBs for the BRACU Mongol-Tori Mars Rover's arm control, improving efficiency and troubleshooting by 20% than the previous version of the rover.
- Optimized AI algorithms for mallet and bottle detection, achieving high accuracy and reduced inference time for detections. Developed an autonomous typing test guidance prototype with rover vision integration, enhancing system reliability by 30%.

Undergraduate Teaching Assistant
BRAC University
02/2025 - 06/2025   *Dhaka, Bangladesh*
Achievements/Tasks
- Supported the academic progress of 120+ students across 3 sections by conducting tutorials, explaining numerical algorithms, and providing one-on-one guidance.
- Assisted in grading and evaluating assignments, quizzes, and labs while collaborating with faculty to improve course delivery and student engagement.

Contributor - Electronics and communications
BRAC University Rescue Rover - BRACU DICHARI
11/2022 - 12/2023   *Dhaka, Bangladesh*
Achievements/Tasks
- Integrated basic electronics circuitry for rescue rovers. Developed system with motors, motor drivers, and microcontrollers, to achieve objectives.
- Implemented entry level rover-to-base station communication systems, improving reliability and efficiency and programmed microcontrollers by utilizing ROS framework to enhance system integration and testing.

PROJECTS

Rover-Mounted Vision Prototype for Autonomous Keyboard Typing and Bottle & Mallet Object Detection (09/2024 - 06/2025) ⧉
- Developed an autonomous keyboard typing test prototype using YOLOv8 for keyboard detection, PaddleOCR for key recognition, and integrated angle and distance mapping for precise interaction.

Sleep Stage Classification with Machine Learning and XAI Implementation (07/2024 - 10/2024) ⧉
- Developed a machine learning model with Explainable AI for photoplethysmography-based four-stage sleep classification, enhancing accuracy and interpretability.

DRISTEE – Depth-aware Recognition and Intelligent Scene Translation for Enhanced Engagement (04/2025 - Present)
- Developing A real-time, cloud-based navigation assistant for visually impaired users that integrates depth-aware mapping, object detection and facial recognition and voice-command NLP in a modular architecture to deliver low-latency, personalized spatial awareness and navigation guidance.

PROJECTS

Vision-based Hand Gesture Virtual Keyboard-Mouse framework with Bilingual Next-word prediction (03/2025 - Present)
- Developed a modular real-time pipeline integrating MediaPipe hand-landmark gesture recognition bilingual LSTM next-word prediction in English and Bangla within a unified keyboard-mouse interface featuring performance monitoring, delivering a low-latency, resource-efficient touchless text entry solution for desktop and wearable devices.

A Vision Transformer-Based Framework for Early Detection of Autism Spectrum Disorder in Toddlers via Facial and Behavioral Analysis (07/2025 - Present)
- Developing a Vision Transformer–based multimodal fusion framework that integrates facial data analysis with complementary behavioral and facial datasets for scalable, proactive early screening of Autism Spectrum Disorder in toddlers.

Comparative analysis of classification algorithms for prediction of academic success of students ⌕
- Developed and evaluated multiple classification models leveraging socio-economic, demographic, and academic features to predict student outcomes as Graduate, Dropout, or Enrolled.

WeHeal - a MERN stack based all-in-one healthcare web application (01/2025 - Present) ⌕
- Engineered an end-to-end telemedicine platform featuring OTP-secured authentication, role-based dashboards, appointment scheduling with video consultations, EMR and e-prescription management, emergency services, payment and insurance integration, online medicine and lab ordering, and feedback.

PUBLICATIONS

Journal
Optimizing Stroke Recognition with MediaPipe and Machine Learning: An Explainable AI Approach for Facial Landmark Analysis
Author(s)
Karim, R. U., Mahdi, S., Samin, A., Zereen, A. N., Abdullah-Al-Wadud, M. M., & Uddin, J.
12 March, 2025
IEEE Access

DOI: 10.1109/ACCESS.2025.3550577

Conference Paper
Machine Learning Approaches in Photoplethysmography-Based Sleep Stage Classification
Author(s)
Ferdous, T., Karim, R. U., Samin, A., Mahdi, S., Tasnim, H., Zereen, A. N.
3 March, 2025
2024 IEEE 2nd International Conference on Electrical, Automation and Computer Engineering (ICEACE 2024)

Pages 117-122, DOI: 10.1109/ICEACE63551.2024.10898858

Conference paper
Improved Photoplethysmography-Based Four-Stage Sleep Classification with Explainable AI-Driven Machine Learning
Author(s)
Ferdous, T., Karim, R. U., Samin, A., Mahdi, S., & Zereen, A. N.
3 March, 2025
2024 IEEE 2nd International Conference on Electrical, Automation and Computer Engineering (ICEACE 2024)

Pages 117-122, DOI: 10.1109/ICEACE63551.2024.10898853

HONOR AWARDS

Dean's List and Vice Chancellor's List (01/2023 - Present)
BRAC University

Second Runner Up - Robosoccer competition (05/2024 - 05/2024)
Robotics Club of BRAC University

Semi Finalist - OnCampus Rounds (02/2023 - 02/2023)
Hult Prize BRAC University 2023

Bronze level Award (05/2023 - 03/2024)
The Duke of Edinburgh's International Awards

VOLUNTEER EXPERIENCE

Lifetime member & Former General Secretary
Notre Dame Cultural Club
02/2020 - 04/2022   *Dhaka, Bangladesh*
Tasks/Achievements
- Directed a team of 30 executives and 70 volunteers to organize the 7th National Cultural Jubilation 2024, achieving a 10x audience growth by collaborating with 120+ institutes and securing sponsorships exceeding fundraising goals by 40%.link: https://bit.ly/3CQmyiJ .
- Pioneered "Virtual Cultural Showdown 2020," one of Bangladesh's first virtual cultural contests, setting a benchmark for online events. link: http://bit.ly/4gdzFJf .

Secretary - Marketing, IT, Archives and Photography
BRAC University Cultural Club
12/2024 - Present   *Dhaka, Bangladesh*
Tasks/Achievements
- Executed targeted social media campaigns as part of the Marketing, IT Archive, and Photography team, driving extensive media outreach and engaging thousands of viewers for events with 1,000+ attendees.
- Designed impactful promotional materials and conducted recruitment interviews, successfully onboarding talented individuals to enhance the club's growth and brand visibility.