Reshad Ul Karim

Computer Science Undergraduate

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

SKILLS AND INTEREST

Python | Java | JavaScript | PHP | SQL | HTML | CSS | Tensorflow | Keras | Pytorch | Scikit-learn | MediaPipe | YOLO | SHAP | LIME | Ensemble | Neural Network | PCB Design | Microcontroller | OpenCV | Github | Machine learning | Artificial Intelligence | Robotics | Explainable AI | LaTeX | Computer Vision

EDUCATION

BSc. in Computer Science and Engineering
BRAC University
09/2022 - *Present* CGPA: 3.9/ 4.00

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

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

WORK EXPERIENCE

Core team member - AI and autonomous systems
BRAC University Mars Rover Team - MONGOL TORI
01/2024 - *Present* *Dhaka, Bangladesh*
https://bit.ly/3OOXw6v

Achievements/Tasks

- Finalist in URC 2024, ranking among the top 38 teams globally out of 102, showcasing advanced engineering and problem-solving skills. Designed high-precision electronic circuits and PCBs for the BRACU Mongol-Tori Mars Rover's robotic arm, improving task 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 autonomous tasks. Developed an autonomous typing test guidance AI prototype with rover vision integration, enhancing system reliability by 30% through machine learning integration.

Undergraduate Teaching Assistant
BRAC University
02/2025 - *Present* *Dhaka, Bangladesh*
https://www.bracu.ac.bd/

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*
https://bit.ly/3ZrwS8x

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

BRACU Mars Rover Mongol-Tori Autonomous Keyboard Typing Test Prototype (09/2024 - Present)

- 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. https://github.com/Reshad-Ul-Karim/Autonomous-Keyboard-typing-test

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. https://github.com/Reshad-Ul-Karim/Sleep-Detection/tree/main/Code

Matrimonial Hub - MySQL and PHP based demo matchmaking site (07/2024 - 10/2024)

- Developed **Matrimonial Hub**, ranked first in a class of 40+ students of the course CSE370: Database Systems project , featuring secure, encrypted matchmaking with dynamic search and robust error handling, built using SQL, PHP, JavaScript, and AJAX. https://github.com/Reshad-Ul-Karim/Matrimonial-Project-370

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 - 12/2024)
BRAC University

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

Lifetime Member (02/2023 - Present)
Notre Dame Cultural Club

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

First Runner Up - Project Display (02/2016 - 02/2016)
Birshreshtha Noor Mohammad Public College Science Club

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

VOLUNTEER EXPERIENCE

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.