Rezowan Hossain Ferdous Shuvo

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Research Assistant, PhD Candidate

PhD candidate and research assistant specializing in computer vision and video understanding with a strong record of publishing and teaching; Alongside research, I have teaching experience in Python, Data Science, and NLP, and industry experience in software development and MLOps deployment. I will contribute data-driven research, reproducible experiments, and scalable prototypes to advance your research agenda in visual understanding and embodied AI.

WORK EXPERIENCE

Research Assistant and Demonstrator (Teaching Assistant) — Since January 2024 **(1 year)**
School of Computing Engineering Technology Robert Gordon University
- Conducted advanced research in video understanding, designing novel deep learning frameworks action recognition and anticipation.
- Key contributions include engineering a TCN-Transformer for surgical action segmentation and a neuro-symbolic model for action anticipation.
- Currently pioneering the application of Large Language Models (LLMs) and Vision-Language Models (VLMs) to enhance visual reasoning for complex robotic tasks.
- Teaching/ instructing the postgraduate students. Conducted lab on Python programming, Data Science, NLP

Research Assistant — From October 2020 to October 2022 **(2 years)**
Time Research and Innovation (TRI) Southampton, United Kingdom (Dhaka-Branch)
- Developed and deployed an end-to-end facial recognition system for smart attendance with MLOps.
- Conducted pivotal research in healthcare AI, analyzing chest X-ray data for COVID-19 detection.
- Played a key role in securing project funding by contributing to grant proposals. Authored multiple research papers and technical reports on Computer Vision, Deep Learning.

Software Developer — From May 2022 to March 2023 **(10 months)**
Beraten Software Corporation 7110 SW Fir Loop, Portland, OR 97223, United States
- Contributed in developing systems for tribal communities for health care services, the child welfare system, and the e-court for criminal case management.

EDUCATION

PhD Candidate — Since March 2023
Robert Gordon University Aberdeen, Scotland, United Kingdom
PhD Project Advisor: **Professor Eyad Elyan**
- Developed a novel Temporal Convolutional Network (TCN)-Transformer model in PyTorch for precise surgical action segmentation and phase recognition.
- Designed a grammar-based neuro-symbolic framework using PyTorch and Hugging Face to predict future actions from video sequences, bridging the gap between perceptual data and symbolic reasoning.
- Currently developing and fine-tuning Large Language Models (LLMs), Vision-Language Models (VLMs), and Vision-Language-Action (VLA) models to enhance visual understanding for complex robotic manipulation tasks.

Masters of Science in Information and Communication Engineering — From January 2019 to December 2021
Bangladesh University of Professionals Dhaka, Bangladesh
Result: CGPA 3.48 (2:1 UK Grade) Masters Project Advisor: Dr. Shamim Al. Mamun
- Developed a deep learning-based student attendance system by creating a novel facial dataset and optimizing a model using MTCNN and VGG16 architectures.
- Integrated the final system into a real-world test environment via a custom API.

Bachelors of Science in Information and Communication Engineering — From January 2015 to January 2019
Bangladesh University of Professionals, Dhaka Bangladesh
Result: CGPA 3.16 (2:1 UK Grade)

SKILLS

Research, Software Development, Problem Solving, Writing, Teaching
- Programming**:** Python, C#, Sql
- Framework: Pytorch, PyTorch Lightning, Tensorflow, DotNet Core, Keras
- ML libraries: Hugging Face, Pandas, Numpy, , Scipy, Sklearn, Seaborn, Matplotlib.
- Tools: Git, Docker

RESEARCH INTERESTS

Multimodal Learning, Video Understanding, and Neuro-Symbolic AI
- Action recognition, segmentation, and anticipation, combining deep learning and neuro-symbolic methods with vision-language(-action) models, and grammar-based reasoning to advance intelligent systems for robotics and healthcare AI.

AWARDS

School of Computing Eng. and Tech. PhD Studentship
A fully funded PhD scholarship was awarded by School of computing, Robert Gordon University.

Employee of the Month
While working in TRI I was awarded EoM.

PUBLICATIONS

Journal Articles

Deep Learning and Attention-Based Methods for Human Activity Recognition and Anticipation: A Compreh
[Md Rezowan Shuvo](), MS Mekala, Eyad Elyan; Cognitive Computation (Springer, **Q1**); 2025 (**Submitted**)

MSBATN: Multi-Stage Boundary-Aware Transformer Network for Action Segmentation in Untrimmed Surgical
[Rezowan Shuvo](), M S Mekala and Eyad Elyan : Computer Vision and Image Understanding (Elsevier, **Q1**); 2025

Deep Learning Models for the Diagnosis and Screening of COVID-19: A Systematic Review
Shah Siddiqui, Murshedul Arifeen, Adrian Hopgood, Alice Good, Alexander Gegov, Elias Hossain, Wahidur Rahman, Shazzad Hossain, Sabila Al Jannat, **Rezowan Hossain Ferdous** & Shamsul Masum. SN Computer Science. (July-2022) link (Springer, **Q2**)

Conference Papers

GPAT: Goal-Progression-Aware Transformer with Recursive Grammar Induction for Action AnticipationG
[Rezowan Shuvo](), M S Mekala and Eyad Elyan; IEEE International Conference on Robotics and Automation (ICRA) (Rank A*) **(Submitted)**

Chirality-Aware Grammar-Guided Surgical Action Anticipation from Video
[Rezowan Shuvo](), MS Mekala, Eyad Elyan, Human Robotic Interactions (HRI)- (Rank A) (**Submitted**)

Performance Analysis of Different Loss Function in Face Detection Architectures,
[Rezowan Hossain Ferdous](), Md. Murshedul Arifeen, Tipu Sultan Eiko & Shamim Al Mamun. International Conference on Trends in Computational and Cognitive Engineering At: Dhaka, Bangladesh. (Dec-2020) link

A Comparative Study of Deep Learning Models for COVID-19 Diagnosis Based on X-Ray Images
Shah Siddiqui, Elias Hossain, **Rezowan Hossain Ferdous**, Murshedul Arifeen, Wahidur Rahman, Shamsul Masum, Adrian Hopgood, Alice Good & Alexander Gegov. Advances in Sustainability Science and Technology, Springer, Singapore (Feb-2022) link

A Next-Generation Telemedicine and Health Advice System
Shah Siddiqui, Elias Hossain, **Rezowan Hossain Ferdous**, Murshedul Arifeen, Wahidur Rahman, Shamsul Masum, Adrian Hopgood, Alice Good & Alexander Gegov. Advances in Sustainability Science and Technology, Springer, Singapore (Feb-2022) link

Naive Bayes based Trust Management Model for Wireless Body Area Networks
Sm Rakibul Hasan Remu, Md. Omar Faruque, **Rezowan Hossain Ferdous**, Md Murshedul Arifeen, Sudman Sakib, S. M. Salim Reza. International Conference on Computing Advancements (ICCA 2020) At: Dhaka, Bangladesh. (Jan-2020) link

VOLUNTARY EXPERIENCE

Volunteering Sessions   Since May 2025
Active School Aberdeen, Scotland, United Kingdom

Reviewer   Since June 2024
IEEE Transactions on Neural Networks and Learning Systems Online

REFERENCES

Eyad Elyan
Professor, Robert Gordon University
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Md Junayed Hasan
AI Engineer , Subsea7
junayed.hasan@subsea7.com

Dr. M Shamim Kaiser
Professor, Jahangirnagar University, Dhaka
Bangladesh
mskaiser@juniv.edu

LANGUAGES

English
Advanced

Bengali/Bangla
Native

SOCIAL NETWORKS

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