Md Rezowan Hossain Ferdous Shuvo

+447423055503 | shuvorezowan@gmail.com | rezowan.info

rezowan | Rezowan-Ferdous | Rezowan | Aberdeen, Scotland, United Kingdom

OBJECTIVE

PhD candidate and Research Assistant specializing in complex surgical video understanding. My research focuses on spatial and temporal context modeling to predict future actions and perform safety evaluations, including potential error detection. I leverage Transformers, State Space Models (SSM), and advanced segmentation/detection algorithms. Experienced in full-stack development (Flask, Django, .NET Core, MSSQL) and MLOps (AWS), bridging the gap between rigorous academic research and scalable industrial solutions.

EXPERIENCE

- **PhD Candidate and Teaching Assistant [⊕]** *Mar 2023 – Present*
  Robert Gordon University Aberdeen, Scotland
  ◦ Conducting advanced research on complex surgical video understanding, focusing on spatial-temporal context analysis.
  ◦ Developing frameworks for future action prediction and safety evaluation to detect potential surgical errors.
  ◦ Implementing novel architectures using Vision Transformers and State Space Models (SSM) for segmentation and detection tasks.
  ◦ Pioneering the application of Large Language Models (LLMs) and Vision-Language Models (VLMs) to enhance visual reasoning for complex robotic tasks.
  ◦ Teaching students; conducted labs on Python programming, Data Science, and NLP.

- **Software Developer** *May 2022 – Mar 2023*
  Beraten Software Corporation [⊕] Portland, OR-USA (Remote)
  ◦ Engineered software solutions for Indian Child Welfare and Tribal Court systems using .NET Core 6 Framework and MSSQL Server.
  ◦ Developed and maintained e-court systems for criminal case management, ensuring robust data handling and security.
  ◦ Managed project version control and collaboration using Bitbucket and GitHub
  ◦ Integrated complex database schemas with .NET backend services to support tribal healthcare and welfare services.

- **Research Assistant** *Oct 2020 – Oct 2022*
  Time Research and Innovation (TRI) [⊕] Southampton, UK (Dhaka Branch)
  ◦ Conducted research projects and led the Software Development Life Cycle (SDLC) in collaboration with developers.
  ◦ Assisted in system designing and requirement engineering to align technical outputs with research goals.
  ◦ Developed and deployed an end-to-end facial recognition system for smart attendance with MLOps.
  ◦ Analyzed chest X-ray data for COVID-19 detection using deep learning models.

EDUCATION

- **Robert Gordon University** *Mar 2023 – Present*
  PhD Candidate in Computer Vision(AI) Aberdeen, Scotland
  ◦ **Advisor:** Professor Eyad Elyan
  ◦ Developing novel frameworks for surgical action segmentation, phase recognition, and anticipation.
  ◦ Designing grammar-guided neuro-symbolic models to enable high-level reasoning over complex video data, providing critical decision support and mitigating potential human errors.

- **Bangladesh University of Professionals** *Jan 2019 – Dec 2021*
  M.Sc. in Information and Communication Engineering Dhaka, Bangladesh
  ◦ **CGPA:** 3.48 (2:1 UK Grade) | **Advisor:** Dr. Shamim Al. Mamun
  ◦ Developed a deep learning-based attendance system using MTCNN and VGG16.

- **Bangladesh University of Professionals** *Jan 2015 – Jan 2019*
  B.Sc. in Information and Communication Engineering Dhaka, Bangladesh
  ◦ **CGPA:** 3.16 (2:1 UK Grade)

Skills and Interests

- **Programming:** Python, C# (.NET Core), Bash, SQL
- **MLOps Tools:** Docker, CI/CD, Git, Packaging, Pytest, Version Control, Bitbucket
- **Tools & Platforms:** Raspberry Pi, Overleaf, MSSQL Server, MATLAB, ROS, Arduino,
- **Deep Learning & ML Frameworks:** PyTorch, TensorFlow, Keras, Hugging Face, Scikit-learn, Pandas, NumPy, SciPy, Matplotlib, Seaborn
- **Mathematics & Statistics:** Linear Algebra, Calculus, Probability, Statistics
- **AI & Data Analytics:** Data Analytics, Machine Learning (ML), Deep Learning (DL), AI, Classification, Regression, Object Detection, Predictive Analysis.
- **Soft Skills:** Project Management, Business & Data-Driven Decision Making, Communication, Team Collaboration

- **Research Interests:** Predictive Analysis, Robotics (Vision), Action Analysis, Video Analysis, Inspections, Reasoning

Publications
<div align="right">J=Journal, C=Conference</div>

[J.1] **Rezowan Shuvo**, MS Mekala, Eyad Elyan. (2025). **Deep Learning and Attention-Based Methods for Human Activity Recognition and Anticipation: A Review**. *Cognitive Computation* (Springer, Q1).

[J.2] **Rezowan Shuvo**, MS Mekala, Eyad Elyan. (2025). **MSBATN: Multi-Stage Boundary-Aware Transformer Network for Action Segmentation in Untrimmed Surgical**. *Computer Vision and Image Understanding* (Elsevier, Q1).

[J.3] Shah Siddiqui... **Rezowan Hossain Ferdous**, et al. (2022). **Deep Learning Models for the Diagnosis and Screening of COVID-19: A Systematic Review**. *SN Computer Science* (Springer, Q2).

[C.1] **Rezowan Shuvo**, MS Mekala, Eyad Elyan. **GPAT: Goal-Progression-Aware Transformer with Recursive Grammar Induction for Action Anticipation**. *European Conference on Computer Vision (ECCV)* (Rank A*) (Submitted).

[C.2] **Rezowan Shuvo**, MS Mekala, Eyad Elyan. (2026). **Chirality-Aware Grammar-Guided Surgical Action Anticipation from Video**. *Human Robotic Interactions (HRI)* (Rank A) (Accepted).

[C.3] **Rezowan Hossain Ferdous**, et al. (2020). **Performance Analysis of Different Loss Function in Face Detection Architectures**. *International Conference on Trends in Computational and Cognitive Engineering*, Dhaka.

Honors and Awards

- **PhD Studentship** *2023*
  Robert Gordon University
  ◦ Fully funded PhD scholarship awarded by the School of Computing Engineering and Technology.

- **Employee of the Month** *2021*
  Time Research and Innovation (TRI)
  ◦ Recognized for outstanding performance and contributions to research development.

Voluntary Experience

- **Reviewer** *Jun 2024 – Present*
  IEEE Transactions on Neural Networks and Learning Systems
  ◦ Reviewing technical manuscripts and providing constructive feedback.

- **Volunteering** *May 2025 – Present*
  Active School Aberdeen, Scotland
  ◦ Engaging in voluntary sessions to support school activities.

References

1. **Eyad Elyan**
   Professor, Robert Gordon University
   Email: e.elyan@rgu.ac.uk

2. **Md Junayed Hasan**
   AI Engineer, Subsea7
   Email: junayed.hasan@subsea7.com

3. **Dr. M Shamim Kaiser**
   Professor, Jahangirnagar University, Dhaka
   Email: mskaiser@juniv.edu