Md Farhan Ishmam

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RESEARCH INTERESTS

Visual Question Answering (VQA), Vision Language Modality Alignment, Multicultural & Low Resource NLP, Resource Efficiency & Frugal Representation.

EDUCATION

- **Islamic University of Technology** Dhaka, Bangladesh
  Master of Science in Computer Science and Engineering *Aug 2023 - Aug 2025 (expected)*
  - **Thesis:** Layer-wise Modality Alignment of Vision-Language Models
  - **Advisors:** Dr. Md. Azam Hossain, Dr. Abu Raihan Mostofa Kamal

- **Islamic University of Technology** Dhaka, Bangladesh
  Bachelor of Science in Computer Science and Engineering; GPA: 3.96 (Ranked: 4th/96) *Jan 2019 - Aug 2023*
  - **Thesis:** Visual Robustness Analysis of VQA [1] and Caption Ranking in Zero-Shot VQA

RESEARCH

1. Visual Robustness Benchmark for Visual Question Answering (VQA)
   MF Ishmam*, I Tashdeed*, TA Saadat*, MH Ashmafee, ARM Kamal, MA Hossain
   ArXiv, 2024 [Preprint] [Code]

2. From Image to Language: A Critical Analysis of Visual Question Answering (VQA) Approaches, Challenges, and Opportunities
   MF Ishmam, MS Shovon, MF Mridha, N Dey
   Information Fusion Journal, 2024 [Paper] [Preprint]

3. FourierKAN outperforms MLP on Text Classification Head Fine-tuning
   AA Imran* and **MF Ishmam***
   Fine-Tuning in Modern Machine Learning: Principles and Scalability at NeurIPS, 2024 [Paper] [Code]

4. BANGLATLIT: A Benchmark Dataset for Back-Transliteration of Romanized Bangla
   M Fahim*, FT Shifat*, F Haider*, DD Barua, MSUR Sourove, **MF Ishmam**, FA Bhuiyan
   Findings of the Association for Computational Linguistics EMNLP, 2024 [Code] [Dataset]

5. CHITROJERA: A Regionally Relevant Visual Question Answering Dataset for Bangla
   DD Barua*, MSUR Sourove*, **MF Ishmam***, F Haider, FT Shifat, M Fahim, FA Bhuiyan
   ArXiv, 2024 [Preprint] [Code]

6. BANTH: A Multi-label Hate Speech Detection Dataset for Transliterated Bangla
   F Haider*, FT Shifat*, **MF Ishmam***, DD Barua, MSUR Sourove, M Fahim, FA Bhuiyan
   ArXiv, 2024 [Preprint] [Code]

7. BNSENTMIX: A Diverse Bengali-English Code-Mixed Dataset for Sentiment Analysis
   S Alam, **MF Ishmam**, NH Alvee, MS Siddique, MA Hossain, ARM Kamal
   ArXiv, 2024 [Preprint] [Code]

8. Contextual Breach: Assessing the Robustness of Transformer-based QA Models
   A Saadat*, NI Asad*, **MF Ishmam**
   ArXiv, 2024 [Preprint] [Code]

9. Penta NLP at EXIST 2024 Task 1-3: Sexism Identification, Source Intention, Sexism Categorization In Tweets
   FT Shifat, F Haider, MSUR Sourove, DD Barua, **MF Ishmam**, M Fahim, FA Bhuiyan
   EXIST at Conference and Labs of the Evaluation Forum (CLEF), 2024 [Paper][Code]

10. Penta ML at EXIST 2024: Tagging Sexism in Online Multimodal Content With Attention-enhanced Modal Context
    DD Barua, MSUR Sourove, F Haider, FT Shifat, **MF Ishmam**, M Fahim, FA Bhuiyan
    EXIST at Conference and Labs of the Evaluation Forum (CLEF), 2024 [Paper] [Code]

Research Tags

Visual Question Answering (3) - [1,2,5]   Multicultural & Low Resource NLP (4) - [4,5,6,7]
Language Mixing (3) - [4,6,7]   LLMs & Multimodal-LLMs (4) - [1,4,5,6]

Teaching Experience

- **Islamic University of Technology**   Dhaka, Bangladesh
  Lecturer, Department of Computer Science and Engineering   *Aug 2023 - Present*
  - **Courses:** Simulation and Modeling (Winter 2024), Microprocessor and Interfacing (Summer 2023), Business Analytics and Technology (Winter 2023).

Industry & Research Experience

- **Yaana Technologies**   Milpitas, CA, USA
  Research Intern, AI Research and Development   *Jan 2024 - Present*
  - **Telecom LLM:** Designing and developing a private Retrieval Augmented Generation (RAG) system using LLM agents for the telecommunications domain.

- **Penta Global**   Dhaka, Bangladesh
  AI Researcher, Research and Development   *July 2023 and Dec 2023*
  - **Bangla NLP:** Conducted research-based projects on romanized Bangla back- transliteration [4], Bangla VQA [5], and transliterated Bangla hate detection [6] systems.

- **Advanced Machine Intelligence Lab**   Dhaka, Bangladesh
  Researcher, Natural Language Processing and Computational Linguistics   *May 2023 and Aug 2023*
  - **VQA Survey:** Compiled a comprehensive survey on VQA through critical analysis and introduced a novel taxonomy of the VQA literature [2].

Projects

1. **Queuing System Simulation:** Open source implementation of queuing systems in C++ [Code]
2. **ML Algorithm Visualizer:** A Jupyter notebook serving as a learning resource to visualize ML algorithms [Code]

Technical Skills

Deep Learning Tools: PyTorch, Hugging Face, JupyterLab/Colab, Scikit Learn, Keras
Programming Languages: Python, C++, C, SQL, Bash, Java, R
General Tools: Git, LaTeX, Draw.io, Visual Studio Code, Docker, Microsoft Office, Obsidian

Relevant Courses

• Natural Language Processing • Digital Image Processing • Machine Learning • Deep Learning • Linear Algebra • Multivariate Calculus • Probability and Statistics • Data Analytics • Big Data Analysis with SQL • Database Management System • Data Mining • Data Structures • Algorithms • Graph Theory • Simulation and Modeling • Object Oriented Programming • Operating System • Software Engineering Principles

Achievements

- *Finalists*, Robi Datathon 3.0 - Bangladesh's largest data science event with 3,500+ participants.
- *EXIST Shared Task* - Achieved Top-10 ranking in Task-2 and 6.