

# Shayekh Bin Islam

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## Education

**Bangladesh University of Engineering and Technology (BUET)**

March'18 - May'23

B.Sc. (Engg.) (Honours), Computer Science and Engineering

CGPA: 3.78/4.00

Relevant Coursework: Machine Learning, Artificial Intelligence, Linear Algebra, Statistics, Calculus, Numerical Methods

## Publications & Preprints

\*=Equal Contribution

- [6] **Open-RAG: Enhanced Retrieval-Augmented Reasoning with Open-Source LLMs** [[Preprint](#)] [[Website](#)]  
Shayekh Bin Islam\*, Md Asib Rahman\*, K S M Tozammel Hossain, Enamul Hoque, Shafiq Joty, Md Rizwan Parvez  
[Accepted in EMNLP Findings 2024]
- [5] **M-RewardBench: Evaluating Reward Models in Multilingual Settings** [[Preprint](#)] [[Website](#)]  
Srishti Gureja\*, Lester James V. Miranda\*, Shayekh Bin Islam\*, Rishabh Maheshwary\*, Drishti Sharma, Gusti Winata, Nathan Lambert, Sebastian Ruder, Sara Hooker, Marzieh Fadaee  
[Under review in ARR towards ACL 2025]
- [4] **MM-Eval: A Multilingual Meta-Evaluation Benchmark for LLM-as-a-Judge and Reward Models** [[Preprint](#)]  
Guijin Son, Dongkeun Yoon, Juyoung Suk, ..., Shayekh Bin Islam, ..., Seungone Kim et al  
[Under review in NAACL 2025 (Score: 4,3,1,5 = 2.83/5.00)]
- [3] **INCLUDE: Evaluating Multilingual Language Understanding with Regional Knowledge** [[Manuscript](#)]  
Angelika Romanou, Negar Foroutan, ..., Shayekh Bin Islam, ..., Marzieh Fadaee, Sara Hooker, Antoine Bosselut et al  
[Under review in ICLR 2025 (Score: 8,8,8,5 = 7.25/10.00)]
- [2] **Improving Offline Meta-Reinforcement Learning With Ensemble-Diversified Actor-Critic** [[Manuscript](#)]  
Shayekh Bin Islam, Haque Ishfaq, M Rahman  
[Submitted to AISTATS 2024]
- [1] **bbOCR: An Open-source Multi-Domain OCR Pipeline for Bengali Documents** [[Preprint](#)] [[Website](#)]  
Imam Mohammad Zulkarnain\*, Shayekh Bin Islam\*, ..., Md Nazmuddoha Ansary, Asif Sushmit, Farig Sadeque et al  
[Submitted to EAAI-AAAI 2024]

## Research Experience

**Georgia Institute of Technology & Duck.AI | PRM-Bench: Evaluating Process-based Reward Models** July'24 - Now  
Advisors: Alex Havrilla, Aran Komatsuzaki, Tuo Zhao | Keywords: PRM, MCTS, Process-Supervision [[Proposal](#)] [[Code](#)]  
> Benchmarking PRMs in math, code, reasoning, game, and agent tasks with human-annotated process-level rewards.

**Sakina.AI, QCRI & Mila | Sakina: An LLM-based Mental-Health Support System** July'24 - Now  
Advisor: Ines Arous, Safa Messaoud | Keywords: Patient Simulation, Multi-Agent LLM [US Patent Filing in Progress]  
> Developing high-quality patient simulation and synthetic datasets towards CBT and psychoanalysis to assist therapists.  
> Adapting existing language models into Arabic culture to build a robust multi-agent diagnosis system.

**University of Michigan & Fatima Fellowship | Learning from Instance Gradients** Aug'23 - Dec'23  
Advisor: Mohamed El Banani | Keywords: Optimization, Byzantine ML, Data Pruning  
> Developing a gradient-based optimization algorithm that selectively back-propagates based on the quality of the gradient signal of each instance in a mini-batch.  
> Unifying the ideas of Byzantine ML and Data Pruning methods at the mini-batch level.

**Mila | Improving Offline Meta-Reinforcement Learning With Ensemble-Diversified Actor-Critic** Mar'22 - Dec'22  
Advisor: H Ishfaq, M Rahman | Keywords: Offline RL, Meta-RL, Uncertainty Estimation [[Manuscript](#)]  
> Proposing uncertainty-aware learning in offline meta-RL setup based on ensemble diversity.

**Dreamfold.AI & Mila | Foundation Models and Sampling Methods for Protein Design** Oct'23 - Jan'24  
Advisor: R Islam | Keywords: RL, Protein Foundation Models, Multi-modality  
> Developing RL environments and reward models for protein structure and sequence design. [[Code](#)]

**Bengali.AI & Apsis S. | bbOCR: An Open-source Multi-Domain OCR Pipeline for Bengali Documents** June'23 - Dec'23  
 Advisor: *Farig Sadeque* | Keywords: Document OCR, Geometric & Illum. Correction  
 > Developing bbOCR: an open-source scalable document OCR system that can reconstruct Bengali documents into a structured searchable digitized format.  
 > Taking geometric distortions and illumination variation into account. [[📄 Preprint](#)]

**Brac U. | A Scalable Bitcoin Blockchain Network by Dynamic Block Size Adjustment using RL** June'23 - Dec'23  
**Thesis Co-Supervisor** | Advisor: *MGR Alam* | Keywords: Offline RL, Inverse RL  
 > Proposing a dynamic block size adjustment system that maximizes the miner's revenue based on the condition of the blockchain network; and exploring online, offline, and inverse RL algorithms in this domain.

**BUET | Bangla Grammatical Error Detection Leveraging Transformer-based Token Classification** Feb'23 - Aug'23  
**Undergrad Project** | Advisor: *Dr. Mohammed Eunus Ali* | Keywords: NLP, GED, GEC, ELECTRA, XLM-RoBERTa  
 > Developing models for detecting grammar, spelling, and punctuation errors in Bangla text using transformer-based architectures, ensemble learning, and rule-based methods. [[📄 Report](#)] [[📄 Code](#)]  
 > Winning solution for [Bhashabhrom: Bangla Grammatical Error Detection Challenge](#)

## Professional Experience

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**Qatar Computing Research Institute (QCRI), HBKU** [[📄 Site](#)] Jan'24 - July'24  
*Research Assistant (Remote)*  
 > Proposing an open-source RAG framework capable of complex reasoning tasks.  
 > Developing efficient Mixture-of-Experts RAG models from dense models.

**Computer Science and Engineering, Brac University** [[📄 Site](#)] June'23 - May'24  
*Visiting Lecturer*  
 > Instructing Artificial Intelligence, Robotics, Software Engineering, and Data Communications courses.  
 > Designing Basic ROS, Kinematics, and PID Control assignments using Husky, UR5, and Hector Drone simulators.  
 > Supervising undergrads working on NLP, Reinforcement Learning, and Robotics toward theses and projects.

**Data Science and Engineering Research Laboratory (DataLab), BUET** Jan'20 - June'20  
*Undergraduate Researcher*  
 > Curating datasets for a health-care chatbot in Bengali language using machine learning and NLP.

## Academic Service

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<b>Reviewer</b>	ICML'25, ACL ARR Dec'24, COLING'25, AISTATS'25, ICLR'25, NeurIPS'24, {Sys2-Reasoning, MATH-AI, SafeGenAi, BehavioralML}@NeurIPS'24, {LLM-Cognition, AutoRL}@ICML'24, {AI4ED, NuCLeaR}@AAAI'24, ACL-BEA'23
<b>Member</b>	Association for Computational Linguistics (ACL) 2020– , ACL SIGEDU 2023–
<b>In-Person Attendance</b>	EMNLP'24 (Miami, FL)
<b>Virtual Volunteer</b>	NeurIPS'21, ICLR'21, ICML'21, ACL'21, NAACL'21, ACL'22, ICLR'22, ICML'22, ICLR'23
<b>Co-founder</b>	Robotics and Intelligent Systems Research Group (RIS), Brac University 2023
<b>Co-founder</b>	BUETSEC: BUET Cyber Security Club 2022
<b>Organizer</b>	Intra-BUET Capture the Flag (CTF) Competition and Workshop 2023

## Other Projects

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**Expedition Aya 2024 | Cohere for AI | Mentors: Marzieh Fadaee, Sara Hooker** July'24 - Aug'24  
 Won **Silver Prize & Most Promising Project** | Keywords: Knowledge Distillation, Data Filtering, Multi-modality, Perplexity  
 > **Maya**: Multimodal Aya – curating a new multilingual image-text dataset and finetuning Aya/SigLIP models.  
 > Identifying mislabeled instances in Aya datasets (instruction and red-teaming datasets).

**First NLP Hackathon, Bangladesh | Complex Named Entity Recognition in Bengali Texts** Feb'23  
**Second Runner-Up** solution | Keywords: NLP, NER, ELECTRA, XLM-RoBERTa  
 > Identifications and classification of named entities in Bengali language texts. The project is designed to be used in various applications such as text analytics and information retrieval systems. [[📄 Report](#)] [[📄 Code](#)]

**Q-TCP: Improving TCP Congestion Control with Machine Intelligence** Jan'22 - Feb'22  
Open-source contribution to [DianGroup's NS3-AI Module](#) | Keywords: RL, DQN, TCP Congestion Control, Networking  
> Reinforcement learning (Q-Learning) agent for TCP congesting control. [[Code](#)]  
> Implementing agent state (i.e., EWMA of the ACK inter-arrival time, packet inter-sending time, current RTT and minimum RTT ratio, the slow start threshold, and current window size) and reward (throughput, delay-based).

**Unity Learn | HummingBird** Nov'20  
An Unity ML-Agents Project In [ML-Agents: Hummingbirds Course](#) | Keywords: PPO, Unity ML-Agents, Game Playing  
> A Reinforcement Learning game using Unity ML-Agents with intelligent flying hummingbirds that can navigate to flowers, dip their beaks in and drink nectar.  
> A training environment is created and neural networks are trained to perform this challenging task, then a player can compete against the birds in a simple mini-game. [[Code](#)]

**Udacity | People Counter App** Mar'20 - June'20  
Intel® Edge AI for IoT Developers **Scholarship Project** | Keywords: SSD, Computer Vision, IoT, Edge AI  
> Detection of people in a designated area, providing the number of people in the frame, average duration of people in the frame, and total count.  
> Leverages deep learning frameworks like Tensorflow, PyTorch, and Caffe combined with Intel's OpenVINO toolkit to impact a real-world computer vision application with an accuracy of about 75% using the SSD512 model.

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## Technical Skills

**Languages** Python, Java, C/C++, Shell, JavaScript, HTML/CSS, Matlab, Intel 8086 Assembly Language, MIPS Assembly  
**ML Tools** PyTorch, Hugging Face, Spacy, Tensorflow, OpenCV, NLTK, Pandas, Matplotlib, Scikit-Learn, OpenAI Gym  
**Development Tools** Slurm, Latex, Git, Docker, VS Code, Visual Studio, IntelliJ Idea, Kubernetes, Postman

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## Talks and Presentations

**“Evaluating Reward Models in Multilingual Settings”**  
> Expedition Aya Lightning Talk, Cohere For AI Community Meetup [[Slides](#)] Aug 2024 (Online, Cohere For AI)  
**“Introduction to Deep Learning with Keras”**  
> Keras Community Day Bangladesh 2023 [[Slides](#)] Oct 2023 (Brac University, Bangladesh)  
**“Bangla Grammatical Error Detection Leveraging Transformer-based Token Classification”**  
> Bhashabhrom: Bangla Grammatical Error Detection Challenge 2023 [[Slides](#)] Mar 2023 (Dept. of EEE, BUET)

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## Honours and Awards

**Dean's List Scholarship, Bangladesh University of Engineering and Technology (BUET)** 2018-19  
**Education Board Scholarship, Government of Bangladesh** 2010-2023 (\$800 in Total)  
**Cohere For AI's Expedition Aya Hackathon 2024 | Silver Prize Project: Multilingual RewardBench** \$4000 API Credits  
**Cohere For AI's Expedition Aya Hackathon 2024 | Most Promising Project: Multimodal Aya** \$1000 API Credits  
**Fatima Fellowship 2023 | Research Collaboration, Mentoring, and Compute Support** Sponsored by Hugging Face  
**The Trojan Detection Challenge 2023 (LLM Edition) | Compute Grant** Received \$500  
**Bhashabhrom: Bengali Grammatical Error Detection Challenge 2023 | Champion** Phase I and II, Awarded \$750  
**Intel® Edge AI Scholarship 2020 | 750 Seats** Full Free Intel® Edge AI for IoT Developers Nanodegree Program  
**First NLP Hackathon BD, 2023 | Second Runner-UP** Awarded \$200  
**Association for Computational Linguistics (ACL) | Membership** 2020-21  
**Simulation Humanoid Robot Wrestling Competition, ICRA 2023 | Participant to the 1/8 finals**  
**Bengali.AI Speech Recognition 2023 | 67/744 Teams (Top 10%)** Kaggle Bronze Medal  
**National Science Olympiad, Bangladesh | Divisional Champion, Rajshahi** 2016