FATIMA JAHARA

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FatimaJahara Fatima Jahara

ABOUT ME

I am actively seeking summer internship opportunities focused on NLP and Responsible AI, emphasizing LLM reasoning and alignment in multimodal and multilingual contexts, and investigating predictive and generative processes for efficient and trustworthy inference, optimization, and reasoning across modalities and languages. I am a PhD student researching on advancing reasoning capabilities in multimodal and multilingual LLMs and making model output and decision making aligned to human preference and ethics. I am deeply invested in pushing the boundaries of natural language understanding and generation, focusing on creating models that can truly understand and generate fair, robust, and trustworthy model output through efficient reasoning and generative processes. My passion also extends to the fusion of Computer Vision, HCI, NLP, and other domains to deepen our understanding of cognitive processes.

EDUCATION

Rutgers, the State University of New Jersey, NJ, US *September 2024 - Present*
Ph.D. in Computer Science
Advisor: Dr. Sharon Levy
Research Focus: *NLP, Responsible AI, LLM Reasoning*
Course work: CS 520 (Introduction to Artificial Intelligence), CS 598 (Trustworthy AI), CS 533 (Natural Language Processing), CS 590 (Socially Cognizant Robotics)

Chittagong University of Engineering and Technology, Bangladesh *February 2016 - June 2021*
B.Sc. in Computer Science and Engineering
Advisor: Dr. Mohammed Moshiul Hoque
Thesis: *Classification of Bangla News Articles by using Multilayer Perception (MLP)*
GPA: 3.79 (with Honors) / 4.00, **Merit Position:** 5^{th} among 120

RESEARCH EXPERIENCE

Rutgers, the State University of New Jersey *July 2025 - August 2025*
Summer Research Assistant
- Investigating how language models represent dialects and how dialect shifts affect different model generation tasks in collaboration with Dr. Candace Ross (ongoing).

Fatima Al-Fihri Predoctoral Fellowship *April 2023 - April 2024*
Predoctoral Fellow
- Worked under the supervision of Michael Saxon and Dr. William Wang, UC Santa Barbara NLP Group on multimodal evaluation in text-to-image models. Our work has been accepted as a spotlight at NeurIPS 2024.
- Developed T2IScoreScore (TS2) a new benchmark using semantic error graphs to objectively test how well VLM metrics rank images by their errors. [link]

CUET NLP Lab, CUET, Bangladesh *June 2019 - June 2021*
Undergraduate Student Researcher
- Developed datasets tailored for low-resource languages: (1) a comprehensive dataset for fine-grained news categorization consisting of four primary categories and 26 fine-grained categories and (2) a Bangla emotion dataset (BEmoD).
- Performed a comparative analysis of 16 different POS tagging methodologies (8 stochastic and 8 transformative) using two tagsets (30-tag and 11-tag) based on execution time and accuracy for Bangla.
- Implemented a transformer-based weighted ensemble framework for fine-grained categorization of Bangla news data.

PUBLICATIONS

Manuscript under review

- **F. Jahara**, M. Dredze, and S. Levy, "Evaluating Implicit Biases in LLM Reasoning through Logic Grid Puzzles" (Under review at October 2025 ACL Rolling Review) [paper][Github Repo]

Published (All published papers can be found here)

- M. Saxon*, **F. Jahara***, M. Khoshnoodi*, Y. Lu, A. Sharma, W.Y. Wang, "*Who Evaluates the Evaluations? Objectively Scoring Text-to-Image Prompt Coherence Metrics with T2IScoreScore (TS2)*, Thirty-Eighth Annual Conference on Neural Information Processing Systems (NeurIPS), 2024." [Github Repo][Dataset]

- **F. Jahara** O. Sharif, and M. M. Hoque, "*Automatic Categorization of News Articles and Headlines using Multi-layer Perceptron*," International Conference on Intelligent Computing & Optimization. Springer, 2021.
- **F. Jahara**, A. Barua, M. A. Iqbal, A. Das, O. Sharif, M. M. Hoque, and I. H. Sarker, " *Towards pos tagging methods for Bengali language: A comparative analysis*," in International Conference on Intelligent Computing & Optimization. Springer, 2020, pp. 1111–1123.
- D. Talukder and **F. Jahara**, "*Real-Time Bangla Sign Language Detection with Sentence and Speech Generation*," 2020 23rd International Conference on Computer and Information Technology (ICCIT), 2020.
- D. Talukder, **F. Jahara**, S. Barua and M. M. Haque, " *OkkhorNama: BdSL Image Dataset For Real-Time Object Detection Algorithms*," 2021 IEEE Region 10 Symposium (TENSYMP), 2021.

In preparation (to be submitted)

Journal Paper

- **F. Jahara**, O. Sharif, and M. M. Hoque, "Benchmark Dataset and Framework on Fine-Grained Classification of Bangla News Articles using Ensemble of Transformers."

PROFESSIONAL AND ACADEMIC EXPERIENCE

Rutgers, the State University of New Jersey, New Brunswick, NJ, US *September 2024 - Present*

Graduate Teaching Assistant

- Lead recitation sessions for CS 439 Introduction to Data Science and CS 210 Data Management for Data Science.
- Design and grade quizzes, assignments, and exams. Provide one-on-one support during weekly office hours.
- Develop course materials and curriculum in collaboration with fellow TAs and the course instructor.

Workera, Palo Alto, CA, US *February 2021 - August 2024*

Senior Assessment Developer *January 2023 - Present*

- Served as the Primary SME developing assessments in Generative AI, Diffusion Models, and LLMs.
- Integrated LLMs into the assessment development pipeline to automate assessment development.
- Implemented an adaptive time allocation model for the Workera GOAT™ (Generative Ontology & Authoring Tool).

Assessment Developer *February 2021 - January 2023*

- Co-chaired a Role Delineation Study to align domains with evolving industry roles.
- Developed adaptive tests (skills ontology, test questions, and performance level descriptors) and associated learning plans tailored to measure proficiency in NLP, Computer Vision, ASR, TensorFlow, and PyTorch.
- Participated in score calibration and learning pathway standardization for Computer Adaptive Tests.

Brain Station 23, Dhaka, Bangladesh *August 2019 - August 2019*

Trainee Software Developer

- Developed a "University Enrollment Log System" to facilitate student-course assignments utilizing Django, Ajax, D3.js, HTML, CSS, and JavaScript.

ADDITIONAL EXPERIENCE

DeepLearning.ai *December 2020 - October 2023*

Alpha Tester

- Assisted in designing functional requirements for the Practical Data Science Specialization courses.
- Created and executed test cases for courses, identifying potential coding workbook errors pre-release.

SELECTIVE PROJECTS

- **Fire Extinguisher:** Developed a simulation-based navigation project involving 4 different bots that traverse a grid with blocked cells, employing decision-making algorithms to reach a goal while avoiding obstacles and dynamically spreading fire cells. Designed an advanced bot Bot 4, an advanced bot with enhanced decision-making algorithms for optimized pathfinding and survival.
- **FoodFond:** Implemented a recommendation engine for restaurants leveraging latent factor collaborative filtering grounded on ratings, reviews, and personalized preferences. Utilized Python, Django Rest Framework for backend development, and HTML5, CSS3, and JavaScript for frontend design and interactivity.
- **Bahon:** A specialized vehicle dataset tailored for Bangladesh to facilitate real-time vehicle detection with a decreased response time using state-of-the-art object detection architectures while laying the groundwork for automating traffic surveillance processes in Bangladesh. (ongoing)

- **Max Solve Time Automation:** An adaptive time allocation system to automate and customize time allocation for test questions based on several criteria (difficulty, domain, cognitive level, etc.) for the Workera GOAT™ (Generative Ontology & Authoring Tool).
- **Item Translation:** A project to automate the translation of test questions from a source language based on different criteria (technicality, audience, etc.) for the Workera GOAT™ (Generative Ontology & Authoring Tool).

SKILLS

Languages: Python, MySQL, SQLite, C, C++, Java, HTML5, CSS3, JavaScript, Ajax
Frameworks & Libraries: TensorFlow, Keras, PyTorch, Hugging Face, Scikit-learn, NumPy, Pandas, Matplotlib, Seaborn, Django Rest Framework, Rasa

SELECTIVE HONORS AND ACHIEVEMENTS

NeurIPS 2024 Scholar Award, Neural Information Processing Foundation *2024*
Predoctoral Fellowship, Fatima Al-Fihri Predoctoral Fellowship *2023*
Global Engineering Education Award, 6^{th} Industrial Engineering and Operations Management Conference *2023*
Dean's Award, Chittagong University of Engineering and Technology (CUET) *2021*
Undergraduate Merit Scholarship, Chittagong University of Engineering and Technology (CUET) *2019*
National Girls' Programming Contest, Bangladesh ICT Division - 2^{nd} *Runners up* *2017*

LEADERSHIP AND PROFESSIONAL ACTIVITIES

International Conference on Machine Learning (ICML) - *Volunteer* *2022*
Coursera - *Beta Tester, Mentor* *April 2021 - April 2022*
Workera - *Community Leader* *February 2021 - May 2021*
CUET Computer Club, Bangladesh - *Project Mentor* *March 2020 - December 2020*
IEEE CUET Women In Engineering, Bangladesh - *Vice Chair* *November 2019 - November 2020*
IEEE, Bangladesh - *Student Member, Professional Member* *June 2019 - Present*
National High School Programming Contest - *Volunteer* *2017*

SELECTIVE TRAINING AND WORKSHOPS

Qubit by Qubit 2020-2021 Introduction to Quantum Computing- *IBM Quantum and The Coding School*
Training on Machine learning and AI with Python- *ICT Ministry and Hi-Tech Park Authority of Bangladesh*
Computational Linguistics & Bangla Language Processing- *IEEE Bangladesh Section*
Ethical Hacking and Blockchain Technology- *IEEE Bangladesh Section*

CONFERENCE PRESENTATIONS

- "*Who Evaluates the Evaluations? Objectively Scoring Text-to-Image Prompt Coherence Metrics with T2IScoreScore (TS2)*," Presenter, Thirty-Eighth Annual Conference on Neural Information Processing Systems (NeurIPS), 2024.
- "*Automatic Categorization of News Articles and Headlines using Multi-layer Perceptron*," Presenter, International Conference on Intelligent Computing & Optimization, 2021.
- " *Towards pos tagging methods for Bengali language: A comparative analysis*," Presenter, International Conference on Intelligent Computing & Optimization.
- "*Real-Time Bangla Sign Language Detection with Sentence and Speech Generation*," Presenter, 23rd International Conference on Computer and Information Technology (ICCIT), 2020.
- " *OkkhorNama: BdSL Image Dataset For Real-Time Object Detection Algorithms*," Presenter, 2021 IEEE Region 10 Symposium (TENSYMP), 2021.
- " *Bangla Sign Language Recognition System*," Presenter, AI for Bangla 1.0, 2021.

SELECTIVE ONLINE COURSES

Finetuning Large Language Models - *Deeplearning.ai*
ChatGPT Prompt Engineering for Developers - *Deeplearning.ai*
Deep Learning Specialization - *Coursera*
DeepLearning.AI TensorFlow Developer Specialization - *Coursera*
Natural Language Processing with Classification and Vector Spaces - *Coursera*
Analyze Datasets and Train ML Models using AutoML - *Coursera*
DeepLearning.AI TensorFlow Developer Specialization - *Deeplearning.ai*
Data Analyst in Python - *Dataquest.io*

REFERENCES

Dr. Sharon Levy, Assistant Professor, Dept. of CS, Rutgers, the State University of New Jersey (s.levy@rutgers.edu)
Dr. Mohammed Moshiul Hoque, Professor, Dept. of CSE, CUET (moshiul_240@cuet.ac.bd)
Dr. Michael Saxon, Postdoctoral Fellow, Tech Policy Lab, University of Washington (saxon@ucsb.edu)
Dr. Scott Frohn, Senior Psychometrician, Khan Academy (scottfrohn@gmail.com)