SHADMANEE TASNEEM MULK

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RESEARCH INTERESTS

Data Science, Machine Learning, Artificial Intelligence, Natural Language Processing, Human-Centered Computing

PROFESSIONAL SUMMARY

- Highly motivated PhD candidate with a background in developing automated data pipelines, advanced predictive models, and interactive visualizations.
- Practical experience in creating LLM-based agentic systems (via LangChain and the OpenAI API) and RAG frameworks to simplify complex data processing tasks.
- Proven ability in designing data-driven tools for mental health, assistive technology, and digital well-being, leading to notable publications.

EDUCATION

BRAC University (June 2025 - Present)
MS in Computer Science and Engineering

Military Institute of Science and Technology (January 2020 - April 2024)
BS in Computer Science and Engineering ***(CGPA: 3.91/4.00)***

AWARDS AND SCHOLARSHIPS

- Winner of URC 2021 and the 3rd position in ARC 2022 globally (University Mars Rover Society)
- Dean's List of Honor in academic years 2021-2023
- Merit Scholarships in academic years 2022 and 2023
- Nabiha Raidaa Scholarship in 2021 for outstanding academic performance

WORK EXPERIENCE

IDARE, Houston, TX - ***Junior Data Scientist*** **(May 2025 - Present);** ***AI Research Apprentice*** **(May 2024 - April 2025)**

- Developed an AI chatbot for Energy, Oil & Gas domain that combines domain knowledge with real-time data from the web to deliver insights to users in natural language.
- Designed smart routing logic that prioritizes reliable datasets, clearly signals uncertainty, and grounds every response in solid metrics and meaningful comparisons.
- Improved code architecture and created interactive visualizations using Python libraries.
- Addressed key data science challenges in sustainability projects, including load forecasting, commodity price prediction, and renewable energy generation.
- Contributed to the design of a user interface for a no-code AI tool aimed at non-technical users.

MIST Mongol Barota (Mars Rover Society) (January 2021 - May 2022)

- Developed Machine and Deep Learning models to classify biosignatures in soil samples and rock images into "extinct", "extant", and "no presence of life" categories.
- Contributed to writing the SAR (System Acceptance Review) report for URC 2021, leading to international recognition.

PUBLICATION(S)

- **S. T. Mulk** and M. N. Islam, "Exploring Dimensionality Reduction Techniques in Word Classification using Surface EMG Signals," 2024 27th International Conference on Computer and Information Technology (ICCIT), Cox's Bazar, Bangladesh, 2024, pp. 465-470. [doi]
- S. N. Nazifa, **S. T. Mulk**, T. A. Sara, T. U. Shakib and M. N. Islam, "Unlocking Voices: Assessing the Usability and Accessibility of Mobile Applications for Stutter Reduction," 2024 27th International Conference on Computer and Information Technology (ICCIT), Cox's Bazar, Bangladesh, 2024, pp. 1016-1021. [doi]
- Sara, T.A., Nazifa, S.N., **Tasneem, S.**, Shakib, T.U., Islam, M.N. (2024). *PPDHero*: Requirements Elicitation and Development of a System to Empower New Mothers on Postpartum Depression. In: Abraham, A., Bajaj, A., Hanne, T., Siarry, P., Ma, K. (eds) Intelligent Systems Design and Applications. ISDA 2023. Lecture Notes in Networks and Systems, vol 1051. Springer, Cham. [doi]

RESEARCH EXPERIENCE

Undergraduate Thesis (April 2023 - December 2024)
- Explored dimensionality reduction techniques for word classification from surface EMG signals using machine learning methods.
- Achieved a 96.28% accuracy using Random Forest with LDA and 93.45% accuracy using XGB with PCA.

Advisor: Dr. Muhammad Nazrul Islam

Unlocking Voices (April 2023 - December 2024)
- Evaluated the usability and accessibility of mobile applications for stutter reduction and communication enhancement in children.
- Identified 14 usability and 12 accessibility issues across 3 apps, highlighting correlations among the violations to improve UI design.

Hydroferma (September 2022 - Present)
- Constructed an IoT-based autonomous hydroponic vertical farming system.
- Developed a full-stack mobile app for remote farm monitoring using Flutter and Firebase.
- Analyzed datasets to train ML models for automating monitoring of hydroponically cultivated lettuce plants, achieving 80% accuracy in real-time decision-making.
- Applied image processing to detect plant lifecycle stages in the vertical farm, resulting in a 98% accuracy in image classification.

PPDHero (September 2022 - December 2023)
- Designed and evaluated the usability of a web-based platform for supporting new mothers struggling with postpartum depression.
- Conducted a SUS evaluation, achieving a score of 84.58 from doctors and 71.79 from new mothers (on a scale from 0 to 100) showing an acceptable quality from a usability perspective.

SKILLS

- **Languages and Tools:** Python, C/C++, Java, Flutter, Plotly, MATLAB, Figma
- **Data Science & ML:** scikit-learn, TensorFlow, PyTorch, LangChain, ChromaDB, OpenAI
- **Web & App Development:** HTML/CSS, PHP, Flask, Django
- **Databases:** Oracle, MySQL, Firebase