Ashaduzzaman Sarker

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CAREER OBJECTIVE

Aspiring to pursue a PhD in Computer Science with a focus on **Natural Language Processing (NLP), Large Language Models (LLMs), and Computer Vision**. Passionate about advancing AI research and contributing to the field through innovative deep learning methodologies and real-world applications.

ACADEMIC BACKGROUND

Bachelor of Science (BSc) in Electrical and Electronic Engineering
BRAC University, Dhaka, Bangladesh **| CGPA:** 3.21/4.00 **| Graduated:** 2021

Higher Secondary Certificate (HSC)
Cantonment Public School and College, Rangpur **| GPA:** 5.00 (Golden A+) **| Year:** 2014

Secondary School Certificate (SSC)
Sathibari ML High School, Rangpur. **| GPA**-5.00 (Golden A+) **| Year:** 2012

EXPERIENCE

Research Assistant (Data Management)
Centre for Entrepreneurship Development (CED), BRAC University | **(*June 2022 – Present*)**

- Conducted extensive research and collected, curated, verified, analyzed and presented up-to-date data on Bangladesh's **RMG industry**, focusing on **supply chain visibility**, **ESG indices**, **sustainability practices** and **renewable energy adoption**. *Key projects include:*
  - ***Mapping export-oriented factories Mapped in Bangladesh (MiB)*** - [***Map***] [***Link***]
  - ***Exploring Adoption of Renewable Energy Technology (RET) among Apparel Exporters*** - [***Link***]
  - ***Addressing Climate Change and Plastic Waste in Bangladesh's Garment Industry*** - [***Link***]

CERTIFICATIONS

- **Large Language Model Agents** | *by **University of California, Berkeley*** [***Link***]
- **IBM AI Engineering Specialization** | *by **IBM*** – [***Link***]
- **Deep Learning Specialization** | *by **DeepLearning.AI*** - [***Link***]
- **Machine Learning Specialization** | *by **Stanford Online & DeepLearning.AI*** - [***Link***]
- **IBM Data Science Specialization** | *by **IBM*** - [***Link***]
- **Training and Fine-tuning Large Language Models (LLMs)** | *by **Weights & Biases*** – [***Link***]
- **Building LLM-Powered Applications** | *by **Weights & Biases*** – [***Link***]
- **TensorFlow Developer Specialization** | *by **DeepLearning.AI*** - [***Link***]
- **Machine Learning in Production (MLOps)** | *by **DeepLearning.AI*** - [***Link***]
- **Computer Science Research - CS 197** | *by **Stanford University***- [***Link***]

TECHNICAL SKILLS

Large Language Models (LLMs): LangChain, prompt engineering, LLM APIs, Retrieval-Augmented Generation (RAG), LLM reasoning, Mixture of Experts (MoE).

LLM Agents: Autonomous agents, multi-agent collaboration, tool use, memory management; ***techniques:*** ReAct, AutoGPT, BabyAGI, Plan-and-Execute; tools: LangChain Agents, AutoGen, CrewAI, OpenAI Function Calling, Hugging Face Transformers**.**

Machine Learning & Deep Learning: Classification, regression, clustering, dimensionality reduction, model optimization.

Neural Networks: CNNs, RNNs, Transformer architectures for computer vision and NLP.

Computer Vision: Object detection, image segmentation, image classification.

Data Science: Data wrangling, analysis, visualization, database management (SQL, NoSQL).

Statistical Modeling: Regression analysis, hypothesis testing, probability distributions.

Network Modeling: Decision trees, ensemble methods, network architecture.

Programming Languages: Python (NumPy, Pandas, SciPy).

Frameworks & Tools: PyTorch, TensorFlow, Keras, Scikit-learn, Hugging Face, LangChain, LangGraph, AutoGen, OpenCV, FastAPI, MLflow, Weights & Biases.

MLOps Tools: Docker, Kubernetes, Flask, Prometheus, Grafana, MLflow, concept drift detection, AWS, GCP, Azure, Git, DVC, GitHub Actions, Jenkins, AWS SageMaker, Azure ML.

RESEARCH INTEREST

Large Language Models (LLMs), LLM Agents, Natural Language Processing (NLP), Multimodal Vision Language Models, Computer Vision, Generative AI.

PROJECTS

Natural Language Processing (NLP) & Large Language Models (LLMs) Projects: [*GitHub*]

- ***Text Sentiment Classification on IMDb & MRPC Datasets (PyTorch & TensorFlow):*** Designed sentiment analysis models to classify text sentiment and detect paraphrases. Utilized Bidirectional LSTM and Transformer architectures to achieve high performance.
- ***Text Summarization with T5 & mT5 (PyTorch):*** Developed models to generate concise summaries from legal and consumer review texts, demonstrating advanced sequence-to-sequence modeling.
- ***Named Entity Recognition (NER) with Transformers (PyTorch & TensorFlow):*** Created and optimized token classification models for named entity recognition, achieving high precision on datasets like CoNLL-2003.
- ***Sequence-to-Sequence Transformers (PyTorch & TensorFlow):*** Engineered translation models to convert text between English and Spanish with high accuracy, using Marian and T5 models.
- ***Masked Language Modeling with DistilBERT & DistilRoBERTa (PyTorch):*** Enhanced language models' contextual understanding through masked language modeling, improving language comprehension on datasets like IMDb.
- ***Causal Language Modeling with GPT-2 & DistilGPT2 (PyTorch):*** Implemented causal language models, generating coherent and contextually appropriate text on datasets like ELI5 and CodeParrot.
- ***Question Answering with BERT & DistilBERT (PyTorch):*** Engineered advanced question-answering models using BERT and DistilBERT, achieving high accuracy on SQuAD and SWAG datasets.

Computer Vision Projects: [*GitHub*]

- ***Image Classification with Vision Transformers & CNNs (Keras & PyTorch):*** Implemented state-of-the-art image classification models on diverse datasets like CIFAR-100 and MNIST.
- ***Object Detection with RetinaNet & Vision Transformers (PyTorch):*** Engineered object detection models, achieving high precision in localization and classification tasks.
- ***Image Segmentation with SAM & U-Net (Keras & PyTorch):*** Developed high-precision models for image segmentation, fine-tuning models like Segment Anything Model (SAM) and U-Net for exceptional accuracy.

Multimodal Vision-Language Models Projects: [*GitHub*]

- ***Image Captioning:*** Fine-tuned a GIT image captioning model on the Pokémon BLIP dataset using PyTorch and Visual Transformers to generate descriptive captions for images.
- ***Document Question Answering (DocVQA):*** Fine-tuned LayoutLMv2 for document question answering on the DocVQA dataset, utilizing PyTorch for model optimization.
- ***Visual Question Answering (VQA):*** Fine-tuned a Visual Question Answering (VQA) model (ViLT) on the Graphcore VQA dataset, employing PyTorch for enhanced performance in answering questions about images.

MLOps Projects: [*GitHub*]

- **End-to-End Machine Learning/Deep Learning Project Implementation:** Expertise in MLOps tools (MLflow, DVC), CI/CD workflows, and scalable deployment using Docker, Kubernetes, Flask, GitHub Actions, Jenkins, and cloud platforms (AWS, Azure, Dagshub).

ACADEMIC ACHIEVEMENTS

Talent Pool Scholarship in Primary School Scholarship Examination (PSC) [2007]
Talent Pool Scholarship in Junior School Scholarship Examination (JSC) [2010]
BRAC University Merit Based Scholarship [2017]

LANGUAGES

IELTS SCORE: OVERALL **7.0 (L: 8.0, R: 6.0, W: 6.0, S: 7.5)**

ACADEMIC AFFILIATION

- **R&D Laboratory, Department of EEE, BRAC University |** *Research Intern (July 2019- Feb 2020)*
- **TEN'S 360-A Digital Marketing Agency |** *Digital Marketing Intern (Apr 2017- Dec 2017)*
- **IEEE BRAC University Student Branch |** *General Member (February 2018-Jan 2021)*
- **Robotics Club of BRAC University |** *Assistant Director (Jan 2017- Dec 2020)*
- **International Conference on Energy and Power Engineering (BRACU) |** *Volunteer (March 2019)*

REFERENCES

Abu S.M. Mohsin, PhD
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Taiyeb Hasan Sakib
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