

ABRAR HOSSAIN

419-320-7896 | abrarhossainhimself@gmail.com | [linkedin.com/in/abrarhossainhimself](https://www.linkedin.com/in/abrarhossainhimself) | abrarhossainhimself.github.io

EDUCATION

The University of Toledo

Master's, Computer Science, GPA 3.90/4.00

Toledo, Ohio

August 2023 – May 2025

Chittagong University of Engineering and Technology

Bachelors, Electrical Engineering, GPA 3.23/4.00

Chittagong, Bangladesh

March 2015 – September 2019

EXPERIENCE

Research Visitor

NSF National Center for Atmospheric Research

August 2024 – December 2024

Remote

- Set up CouchDB, Chords, and Streampipes on ACCESS Jetstreams for community weather data storage.
- Built data orchestrator for efficient data routing, achieving 39% transmission efficiency gain
- Reduced deployment costs by 22% for communities implementing the project

Research Intern

NSF National Center for Atmospheric Research

May 2024 – August 2024

Boulder, CO

- Designed private LoRa network for 6+ data types with Raspberry Pi gateways and central server.
- Improved wind forecasting with edge-ML, achieving 26% accuracy gain on Raspberry Pi
- Image analysis with TensorFlow, 23% accuracy gain, 3x faster training, and 93% precision on 10,000+ images

Graduate Research Assistant

The University of Toledo

August 2023 – Present

Toledo, OH

- Contributed to an NSF-funded project to design HPEE, a new auto-tuning algorithm for optimizing HPC applications on edge devices
- Achieved 2.5X more efficiency with HPEE than benchmark methods
- Improve High-performance computing (HPC) systems through stochastic modeling and optimization.

PROJECTS

Fantasy Premier League points prediction using LSTM

March 2020 – April 2020

- Scraped understat.com for player data to train an LSTM model.
- Developed and deployed XGBoost and Decision Trees for performance comparison.
- Optimized weekly team selections using linear programming, adhering to fantasy game rules and budget limits.
- Frameworks used: Scikit-optimize, LSTM, XGBoost, Random Forest, Pandas, Scipy, Numpy.

RAG-Based LLM Chatbot with Multimodal Capabilities

October 2024 – December 2024

- Developed a Generative AI application using Azure OpenAI for question answering and text-to-image generation.
- Designed a custom chatbot API integrated with Azure OpenAI and multimodal capabilities for conversational AI.
- Built an interactive web interface with Next.js and React, including an admin panel for embedding management.
- Frameworks used: Next.js, FastAPI, Azure OpenAI, Pinecone, TailwindCSS, LangChain, TypeScript.

PUBLICATIONS AND POSTERS

- **AbRAR Hossain**, Abdel-Hameed Badawy, Mohammad Atiqul Islam, Tapasya Patki, Kishwar Ahmed. **HPC Application Parameter Autotuning on Edge Devices: A Bandit Learning Approach (HiPC 2024)**
- Abubeker Abdurahman, **AbRAR Hossain**, Kevin A Brown, Kazutomo Yoshii, Kishwar Ahmed. **Scalable HPC Job Scheduling and Resource Management in SST (WSC 2024)**
- **AbRAR Hossain**, Kishwar Ahmed. **Automating HPC Model Selection on Edge Devices (SC 2023)**

TECHNICAL SKILLS

Languages: Python, C/C++, SQL, HTML/CSS, R

Frameworks: Scikit, MATLAB, Pyomo, GAMS

Developer Tools: Git, Docker, Google Cloud Platform, VS Code, Visual Studio, PyCharm, IntelliJ, Vim

Libraries: Tensorflow, PyTorch, BoTorch, PuLP, CBC Pandas, NumPy, Matplotlib