

ABRAR HOSSAIN

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EDUCATION

The University of Toledo

Master's, Computer Science, GPA 4.00/4.00

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

August 2024 – December 2024

NSF National Center for Atmospheric Research

Remote

- Set up CouchDB, Chords, and Streampipes on ACCESS Jetstreams for community weather data storage.
- Built data orchestrator for efficient data routing, achieving 30% transmission efficiency gain
- Reduced deployment costs by 25% for communities implementing the project

Research Intern

May 2024 – August 2024

NSF National Center for Atmospheric Research

Boulder, CO

- Designed private LoRa network for 6+ data types with Raspberry Pi gateways and central server.
- Improved wind forecasting with edge-ML, achieving 20% accuracy gain on Raspberry Pi
- Image analysis with TensorFlow, 25% accuracy gain, 3x faster training, and 95% precision on 10,000+ images

Graduate Research Assistant

August 2023 – Present

The University of Toledo

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

Spoti-safe: Spotify Playlist Backup Platform

May 2024 – June 2024

- Developed a Flask-based web application to back up Spotify playlists by exporting track information to CSV files.
- Integrated Spotify OAuth for secure access to both public and private playlists using Authlib.
- Implemented RESTful API endpoints to retrieve playlist details and automate data extraction.
- Frameworks used: Flask, Authlib, Spotify Web API, Pandas.

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