Shazzad Hasan

shazzadraihan@gmail.com

Web | GitHub | LinkedIn

+4407947619711

Education

- **Durham University** — Durham, UK
  MSc in Scientific Computing and Data Analysis — *Sept 2023 - Sept 2024*
  Specialisation: Financial Technology
  Courses: Introduction to Statistics and Data analysis, Introduction to Machine Learning, Introduction to Scientific Computing, Introduction to High-Performance Computing, Performance Engineering, GPU Programming, Advanced Algorithms, Discrete Systems, Financial Mathematics, Financial Technologies, Professional Skills
- **North South University** — Dhaka, Bangladesh
  BSc in Electrical and Electronic Engineering — *Sept 2015 - Dec 2020*
  Specialisation: Artificial Intelligence
  Specialisation Courses: Artificial Intelligence, Machine Learning, Pattern Recognition and Neural Network, Introduction to Multi-Agent Systems and Control

Skills Summary

- **Fields of Interest:** Quantitative Analysis, Data Science, Data Analytics, Machine Learning, Software Development
- **Key Skills:** Mathematical Modelling and Simulation, Developing Machine Learning and Deep Learning Models, Data Analysis and Storytelling, Financial Mathematics
- **Programming Languages:** Python, C++, C, SQL, MATLAB
- **Database Management Systems:** PostgreSQL, SQLite
- **Frameworks and Libraries:** PyTorch, Keras, scikit-learn, OpenCV, pandas, NumPy, SciPy, Matplotlib, CUDA, OpenMP, MPI, likwid, gprof, FastAPI, Beautiful Soup
- **Software:** Building RESTful APIs, Web Scraping, HTML, CSS, Git and GitHub, Continuous Integration and Build System, Unit Testing, macOS, Unix/ Linux, Bash
- **Data Analytics Tools:** Tableau, Excel

Employment

- **North South University** — Dhaka, Bangladesh
  Research Assistant, Advisor: Dr. Mohammad Monir Uddin — Jan 2017 - Dec 2017
  - Expanded the PDEG method for model order reduction of structured dynamical systems and the RKSM method for solving second-order structured Lyapunov matrix equations.
  - Developed a model for computing Riccati-based feedback stabilization matrix from the reduced order state-space system to stabilize a large-scale unstable power system model.

Projects

Current Projects:

- **Detecting Anomaly and Fraudulent Accounts on Ethereum with Machine Learning** (Python, scikit-learn, Keras)
  - Working as part of my MS Thesis and Project.

Completed Projects:

- **Performance Analysis and Efficient CUDA Implementation of Matrix Arithmetic** (C++, CUDA)
  - Used gprof to analyse and visualize execution times of serial code and identify hotspot functions.
  - Used likwid to profile memory and floating-point operations of the hotspot functions and plotted roofline model.
  - Used CUDA to implement loop parallelism within compute functions and extended this to task parallelism.
- **Parallelization and Scaling Analysis of 2D Reaction-diffusion System** (C, OpenMP, MPI)
  - Implemented parallel code of the serial implementation of a variant of FitzHugh-Nagumo model namely, the 2D reaction-diffusion system using OpenMP and MPI.
  - Compared the performance of the serial code against the parallelized version and investigated weak and strong scaling.
- **Predicting Pulmonary Fibrosis Progression Using Deep Learning** (Python, Keras, scikit-learn)
  - Worked in a team to develop a model for predicting the progression of the disease in patients suffering from pulmonary fibrosis using CT scan images of their lungs, clinical metadata, and baseline FVC values.
- **A Machine Learning Approach for Future Career Planning in IT in Bangladesh** (Python, scikit-learn)
  - Collected job-circular data in Information Technology in Bangladesh and developed a model to assist job seekers in comprehending and securing their most desired jobs.
- **Gray-Scott Reaction-diffusion System Simulation Software** (C++)
  - Worked in a team to build an agile, responsible, and collaborative software.
  - Used GoogleTest framework for unit testing, created a build system and implemented continuous integration for our git repository.
- **Software Project Management**
  - Worked in a team to develop a project management plan by creating a Gantt Chart for the software development of a client company.

Publications

- **S Hasan**, AM Fony, MM Uddin (2019). Reduced Model-Based Feedback Stabilization of Large-scale Sparse Power System Model. In Proceedings of the International Conference on Electrical, Computer and Communication Engineering.
- **S Hasan**, MM Uddin (2017). Solution of Large-Scale Lyapunov Matrix Equations for PDEG-Based Model Reduction of Structured Dynamical Systems. In Proceedings of the 6th International Conference on Computing, Communication and Sensor Network.
- **S Hasan**, MM Uddin (2017). PDEG Based Model Reduction of Structured Dynamical Systems. 20th International Mathematics Conference, Bangladesh. [Poster]

Professional Development

- **MITx** edX, Online
  MicroMasters Program in Statistics and Data Science Sept 2021 - Present
  5 instructor-led MIT graduate-level courses: 6.431x: Probability - The Science of Uncertainty and Data, 18.6501x: Fundamentals of Statistics, 6.86x: Machine Learning with Python: from Linear Models to Deep Learning, 14.310x: Data Analysis for Social Scientists, 14.310Fx: Data Analysis in Social Science - Assessing Your Knowledge (assessment course of 14.310x), 6.419x: Data Analysis: Statistical Modeling and Computation in Applications, DS-CFx: Capstone Exam in Statistics and Data Science

  XSeries Program in Computational Thinking using Python Jan 2022 - May 2022
  Courses: 6.00.1x: Introduction to Computer Science and Programming Using Python, 6.00.2x: Introduction to Computational Thinking and Data Science

- **edX and Coursera** Online
  MicroBachelors Program in C++ Programming & Data Structures - NYUx
  Deep Learning Specialization - deeplearning.ai
  AI for Medicine Specialization - deeplearning.ai
- **Summer School**
  Oxford Machine Learning Summer School, Machine Learning x Health track Virtual, 2022

References

Dr. Ioannis Ivrissimtzis, ioannis.ivrissimtzis@durham.ac.uk
Associate Professor, Department of Computer Science, Durham University, UK
Dr. Mohammad Monir Uddin, monir.uddin@northsouth.edu
Associate Professor, Department of Mathematics and Physics, North South University, Dhaka, Bangladesh