MD BORHAN UDDIN

The Department of Mathematics and Statistics, Washington State University, Pullman, WA 99164|

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Education

MS in Statistics   *August 2023 – Present*
CGPA: 4.00/4.00
Advisor: Professor Dr. Nairanjana Dasgupta
The Department of Mathematics and Statistics, Washington State University, Pullman, WA, USA

MS in Statistics   *2021-2023*
CGPA: 3.84/4.00
Thesis title: *Deep Learning Models to Forecast Air Quality*
Thesis supervisor: Professor Dr. Khalidur Rahman
Thesis Co-supervisor: Professor Dr. Md Jamal Uddin
Department of Statistics, Shahjalal University of Science & Technology, Sylhet, Bangladesh

BSc in Statistics   *2017-2020*
CGPA: 3.46/4.00 (3.75 in last 55 credits)
Department of Statistics, Shahjalal University of Science & Technology, Sylhet, Bangladesh

Awards & Honors

1. *Sidney G. Hacker Graduate Scholarship*, Washington State University.   *Fall 2023 – Spring 2025*
2. *National Science and Technology Fellowship (NST)*, Ministry of Science and Technology, People's Republic of Bangladesh.   *2022-23*

Research Experience

1. **Research Assistant (RA), Washington State University**   *August 2024 – Present*
   Project: Statistical Foundations of Artificial Intelligence
   Principal Investigator (PI): Professor Dr. Nairanjana Dasgupta[*]
   • Explored foundational statistical principles in AI, focusing on challenges in imbalanced datasets.
   • Contributed to curriculum development to increase the visibility and enrollment of data analysis programs.

2. **Research Assistant (RA), Research Center, SUST**   *July 2022 – June 2023*
   Project: Trend of air quality and investigating its association with urbanization around the major cities of Bangladesh
   Principal Investigator (PI): Professor Dr. Khalidur Rahman[**]

- Investigated relationships between urbanization and air quality through data extraction, analysis, and manuscript preparation.

3. **Research Assistant (RA), Research Center, SUST** *July 2021 – June 2022*
   Project: An evaluation of time series models and machine learning algorithms for predicting temperature in Sylhet, Bangladesh
   Principal Investigator (PI): Professor Dr. Khalidur Rahman[**]
   - Developed and compared predictive models including ARIMA, ARIMAX, KNN, SVM, Random Forest, AdaBoost, and ANN.
   - Performed data analysis and contributed to manuscript preparation.

4. **Research Assistant (RA), Research Center, SUST** *October 2020 – September 2021*
   Project: Modelling Multidimensional Elderly Disease Outcomes Using Classical and Bayesian Approaches
   Principal Investigator (PI): Dr. Mohammad Romel Bhuia[**]
   - Conducted data collection, exploratory data analysis, and questionnaire preparation.
   - Determined risk factors for elderly diseases across strata using Joint Models (JM).

5. **Research Assistant (RA), Research Center, SUST** *July 2020 – June 2021*
   Project: Improving patient management in Cardiology Department, MAG Osmani Medical College, Sylhet, Bangladesh
   Principal Investigator (PI): Professor Dr. Khalidur Rahman[**]
   - Utilized M/M/c/c and M/M/c/K queuing models to optimize bed allocation and measure departmental performance.
   - Conducted data preparation, analysis, visualization, and literature review.

   *Chair, Department of Mathematics and Statistics, Washington State University
** Department of Statistics, Shahjalal University of Science and Technology, Sylhet, Bangladesh

Teaching Experience

1. **Instructor - Probability and Statistics, STAT-360** *Summer 2024*
   Department of Mathematics and Statistics, Washington State University
   - Independently designed and taught the course, engaging students in probability theory and statistical inference through interactive lectures and assessments.

2. **Teaching Assistant - Introduction to Statistical Methods, STAT-212** *Spring 2024*
   Department of Mathematics and Statistics, Washington State University
   - Guided lab sessions, assisted with data analysis projects, and provided feedback to enhance students' understanding of statistical methodologies.

3. **Teaching Assistant - Calculus I, MATH-171**   *Fall 2023*
   Department of Mathematics and Statistics, Washington State University
   • Supported students in mastering foundational calculus concepts through problem-solving sessions and personalized guidance.

Publications

1. **Optimizing Inpatient Flow and Resource Allocation in Cardiology Using Queuing Theory: A Case Study from a Tertiary Hospital in Bangladesh**
   Authors: Md Borhan Uddin, Khalidur Rahman, Md Asaduzzaman, Sabbir Tahmidur Rahman
   Status: Under review, *SSM - Health Systems*

2. **Perspectives of University Students on Life During the COVID-19 Pandemic: Investigating the Role of Financial Capacity in a Secondary City of Bangladesh**
   Authors: Md Borhan Uddin, Khalidur Rahman, Md Sabbir Hossain, Nafiul Hasan, Mahfuzer Rohman, Fazle Elahi Md Faisal
   Status: Under review, *Journal of Education and Health Promotion*

3. **An Evaluation of Time Series Models and Machine Learning Algorithms for Predicting Temperature in Sylhet, Bangladesh**
   Authors: Md Borhan Uddin, Khalidur Rahman
   Status: Ready to submit

4. **A Comparative Study of ARIMA and Hybrid ARIMA-GARCH Models in Forecasting the Exchange Rate of Bangladesh**
   Authors: Md Borhan Uddin
   Status: Published in the International Conference: *ICERIE 2023 (icerie.sust.edu)*

5. **Modeling Monthly Rainfall in Noakhali Coastal Region of Bangladesh: A Box-Jenkins Approach**
   Authors: Md Borhan Uddin
   Status: Published in the International Conference: *ICERIE 2023 (icerie.sust.edu)*

Presentation

How Depressed Are the Admission Candidates in Sylhet
Best poster award, the International Seminar and STATFEST 2023

Data Literacy Playshops Facilitator

Facilitated Washington State University's data literacy events for K-8 students, introducing data as a "Fourth Dimension of Literacy." Locations included Brewster (Fall '23), Yakima (Spring '24), and Toppenish (Spring '24).

Skills

Programming & Analysis: Python, R (Advanced); C, C++, Java (Introductory).
Data Analysis: SPSS, SAS, STATA, MS Excel (Advanced).
Database Management Systems (DBMS): MySQL (Intermediate).
Language: Bengali (Native) and English (Fluent).
Sports: Cricket, Football, Badminton, Chess

Statistical Consultancy

SUST Data Science Club   *Jan 2023 – June 2023*

Standardized Test Scores

Graduate Record Examination (GRE): 309 (Quantitative Reasoning: 159; Verbal Reasoning: 150; Analytical Writing Assessment: 3.5)

Extracurricular Activities

1. **Treasurer**   *January 2024 - Present*
'American Statistical Association WSU Graduate Student Chapter'
Managed chapter finances, organized professional events, and promoted ASA initiatives among graduate students.
2. **Founding President of 'SUST Data Science Club'**   *2023*
Established the club to encourage students in the Department of Statistics at SUST to develop skills in data science and AI.
3. **Ex-Joint Secretary at 'SUSTian Society of Lakshmipur-SSL'**   2022

Other Experiences

GRE Instructor, SUST Career Club   *April 2022 – Sept. 2022*
Instructor, Higher secondary Mathematics and Physics   *Jan. 2022 – June 2022*
Focus university admission coaching center, Sylhet