





# MD MAHMUDUR RAHMAN

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## EXPERIENCE

### Graduate Research Assistant



Graduate School, UMBC

 August'19 – Present     Maryland, USA

- Developing deep learning algorithms for survival analysis, competing risk analysis, and multi-state modeling.
- Developing interpretable machine learning models for healthcare data analysis.
- Quantifying uncertainty in machine learning predictions and making causal inferences from the observational data.
- Analyzing multi-modal data (clinical data and medical image data) for risk predictions.

### Deputy Director

The central Bank of Bangladesh

 April 2018 - On study leave     Dhaka, Bangladesh

- Preprocessing and analyzing Export Receipts of Bangladesh & Central Account data using Enterprise Data Warehouse system.
- Preparing the quarterly & annual review on Export Receipts and the manuscript of “Annual Export Receipts of Goods & Services”.

### Lecturer in Statistics

Bangladesh University of Business and Technology

 June 2017 – September 2017     Dhaka, Bangladesh

- Designing and implementing effective teaching and assessing the students' work and progress, providing constructive feedback.

## PROJECTS


- Estimating the True Effect of Treatment on Outcome using Efficient Causal Inference Models (Jan 2021 – May 2021)
  - We compared the structural causal model (SCM) and propensity score (PS) based causal inference methods on risk predictions and proposed a novel approach for estimating the individualized treatment effect on outcome by retraining the model with the flipped labels in the training dataset.
- A Pseudo-value based Neural Additive Model for Multi-state Survival Analysis (Sep 2020 – Dec 2020)
  - We proposed an interpretable neural additive multi-state model based on pseudo values (derived from a consistent Landmark Aalen-Johansen estimator) to provide better insights into the disease progression of the patients, relaxing the underlying stochastic assumptions.
- Comparing the explainability of the Deep Learning Models (Jan 2020 – May 2020)
  - We compared the performance of some deep learning models, such as VGG-16 and RESNET-50, based on the explainability. An explainable method named Gradient Class Activation Mapping (Grad-Cam) was used to explain the models' predictions, which can capture the relevant region/pixels of an image.
- Machine learning approaches to Predict Early Sepsis in Incentive Care Unit (Sep 2019 – Dec 2019)
  - The project's goal was to predict sepsis among ICU patients at an early stage using non-temporal machine learning approaches.

## EDUCATION

### Ph.D. Student, Information Systems

University of Maryland, Baltimore County


CGPA: 3.86 out of 4.00

 Expected Graduation: June 2024

### M.S. in Statistics

University of Dhaka, Bangladesh


GPA: 3.89 out of 4.00

 Graduation: March 2017

### B.S. in Statistics

University of Dhaka, Bangladesh

CGPA: 3.78 out of 4.00

 Graduation: November 2014

## RELEVANT PUBLICATIONS

- **Md Mahmudur Rahman**, Shinya Matsuzaki, Koji Matsuo, Sanjay Purushotham, **DeepPseudo: Pseudo Value Based Deep Learning Models for Competing Risk Analysis**. Proceedings of the AAAI Conference on Artificial Intelligence, 35(1), 479-487.
- **Md Mahmudur Rahman**, Sanjay Purushotham, **PseudoNAM: A pseudo value based interpretable neural additive model for survival analysis**. AAAI 2021 Fall Symposium (Human Partnership with Medical AI: Design, Operationalization, and Ethics).

## RELEVANT COURSES

- Deep Learning
- Data Analytics: Applications in Healthcare with R
- Graphical and Statistical Modeling
- Causal Inference in AI and ML
- Introduction to NLP

## SKILLS

Python   R   Tensorflow   Keras   Pytorch  
Statistical Software Analysis: STATA, SPSS, Excel  
SQL   LaTeX   SAS   Fortran

## HONORS AND AWARDS

- **Dean's Award** - University of Dhaka, Bangladesh, November, 2016
- **NST Fellowship for Research** from Ministry of Science and Technology, Bangladesh, 2016
- **Best Poster Award**, IS Poster Day, UMBC, April, 2021