MD MUHTASIM BILLAH

PhD Candidate | Data Science | Machine Learning | Statistics | Stochastic Modeling
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WORK EXPERIENCE

Graduate Research/Teaching Assistant
Washington State University

📅 Aug 2018 – Ongoing   📍 Pullman, WA

- Developed and further improved a preexisting probabilistic model based on Monte Carlo method written in C++ and Fortran.
- Utilized the stochastic model for studying key parameters for drug delivery through blood brain barrier (BBB) as an aid for neurodegenerative diseases such as Alzheimer's and Parkinson's.
- Studied design parameters and relevant characteristic properties for manufacturing functional nanoparticle for drug delivery.
- Used finite volume method (FVM) for solving inverse heat transfer problem using Bayesian Inference technique.

DATA SCIENCE PROJECTS

- Multilabel Classification of Drug from their Mechanism of Action (MoA)
  * Employed several DNN architectures i.e. FFNN, ResNet, LSTM etc.
  * Performed multilabel stratified k-fold cross validation for resampling.
  * Created model ensemble to further minimize the cross entropy loss.
  * Acquired bronze medal in the associated Kaggle competition (2020).
- End-to-end Recommender Systems for Amazon Products
  * Used Apache Spark to handle large Amazon datasets (233M reviews).
  * Wrote Python and SQL scripts to parse and import data into MySQL.
  * Applied multiple memory based (both user and item based) and model based (SVD, ALS matrix factorization) collaborative filtering methods.
  * Harnessed fast cloud computing environment on AWS EC2 (Linux).
- Cancer Classification from Gene Expression Monitoring
  * Applied k-means clustering on gene expression (microarrays) data.
  * Performed dimensionality reduction (PCA) on 7,123 human genes.
- Influence of Socioeconomic Factors on Female Employment in Bangladesh
  * Processed World Bank data on Bangladesh spanning over 30 years.
  * Performed regression analysis on the trend of female employment.

PUBLICATIONS

Journal Articles

- Al Khan, **MM Billah**, C Ying, J Liu, P Dutta, *Bayesian Method for Parameter Estimation in Transient Heat Transfer Problem*, International Journal of Heat and Mass Transfer (**2020**) 166, 120746.
- **MM Billah**, H. Deng, P. Dutta, J. Liu, *Receptor Mediated Endocytosis with and without Clathrin Dependency: Key Parameters Study*, Nanoscale (**To be submitted**).

Conference Proceedings

- **MM Billah**, H. Deng, P. Dutta, J. Liu, *Investigation of the Key Parameters Impacting the Receptor Dependent Clathrin-mediated Endocytosis through Stochastic Modeling and Simulations* American Physical Society, (**2019**) L32–003.

EDUCATION

Ph.D. Mechanical Engg.   GPA: 3.94/4.00
Washington State University   📅 Aug 2022

Multiscale Modeling, Stochastic (Monte Carlo) Simulations

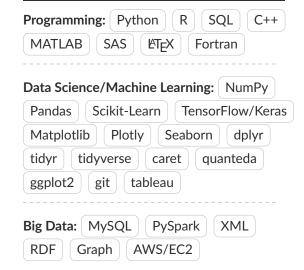- -

M.S. Statistics   GPA: 4.00/4.00
Washington State University   📅 Jan 2022

Relational Database, Machine Learning, Statistical Computing

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B.S. Mechanical Engg.   GPA: 3.55/4.00
BGD U. of Engg. and Tech.   📅 Feb 2017

TECHNICAL SKILLS

Programming: Python | R | SQL | C++ | MATLAB | SAS | LaTeX | Fortran

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Data Science/Machine Learning: NumPy | Pandas | Scikit-Learn | TensorFlow/Keras | Matplotlib | Plotly | Seaborn | dplyr | tidyr | tidyverse | caret | quanteda | ggplot2 | git | tableau

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Big Data: MySQL | PySpark | XML | RDF | Graph | AWS/EC2

AWARDS/HONORS

- Best project (1st among 15 teams) award, CptS 415: Big Data, WSU, Fall 2020.
- Dean's List Scholarship, Faculty of Mechanical Engineering, BUET 2017.
- University Merit Scholarship, BUET 2016.
- Dean's List Scholarship, Faculty of Mechanical Engineering, BUET 2016.

CERTIFICATES

- Deep Learning Specialization (Coursera)
- Machine Learning (Coursera)
- Python Programming (DataCamp)
- Data Scientist with Python (Ongoing)