# MD MUHTASIM BILLAH

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#### **WORK EXPERIENCE**

### Graduate Researcher Washington State University

## Aug 2018 - Ongoing

github.com/mmbillah

Pullman, WA

- Implemented finite volume method (FVM) for solving inverse heat transfer problems using the Bayesian Inference machine learning algorithm.
- Developed and further improved a preexisting probabilistic model based on Metropolis Monte Carlo method written in C++ and Fortran.
- Utilized the stochastic model for studying the key parameters of transcytosis 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 to the brain.

#### DATA SCIENCE PROJECTS

- Multilabel Classification of Drug from Mechanism of Action (MoA) &
  - \* Employed several DNN architectures i.e. FFNN, ResNet and LSTM.
  - \* Performed multilabel stratified k-fold cross validation for resampling.
  - \* Created model ensemble to further minimize the cross entropy loss.
  - \* Acquired bronze medal in associated Kaggle competition (2020).
- Building 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).
- - \* Performed PCA on 7,123 human genes (found from microarrays data).
  - \* 85% of the total variance was found to be explained by top 50 genes. \* Applied k-means clustering for analyzing cancer classes AML and ALL.
  - \* Employed Elbow and Silhouette Score method for selection of k.
- Female Employment Against Socioeconomic Factors in Bangladesh 🔗
  - \* Processed World Bank data on Bangladesh spanning over 30 years. \* Utilized statistical testing and diagnostic plots for checking model
  - assumptions, possible outliers, multicollinearity and autocorrelations.
  - \* Multivariate regression achieved an adjusted R-squared value of 0.99.

#### SELECTED PUBLICATIONS

• 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.

#### RELATED COURSEWORK

Big Data and Cloud Computing Data Mining and Analysis **Applied Linear Models Neural Networks** Statistical Theory Genomic Data Analysis Design and Analysis of Experiments **Numerical Methods** Statistics for Engineers and Scientists

#### **EDUCATION**

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

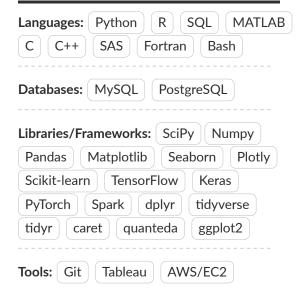
High performance computing (HPC), multiscale probabilistic (Monte Carlo) modeling

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

ETL pipeline, time series, forecasting and predictive modeling, statistical computing

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

## **TECHNICAL SKILLS**



#### AWARDS/HONORS

- Bronze medal (top 9%), Kaggle mechanism of action (MoA) detection competition, 2020.
- Best project (1st of 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.

#### CERTIFICATIONS

- Deep Learning Specialist (deeplearning.ai)
- Machine Learning (Stanford University)

