

MD MUHTASIM BILLAH

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WORK EXPERIENCE

Graduate Researcher


Washington State University

 Aug 2018 – Ongoing

 Pullman, WA

- Implemented finite volume method (FVM) for solving inverse heat transfer problems using Bayesian Inference machine learning technique. 
- Developed and further improved a preexisting probabilistic model based on Metropolis Monte Carlo algorithm written in C++ and Fortran for studying bio/nanoparticle transport across blood-brain barrier (BBB).
- Studied complex polymer/solvent/nonsolvent systems for industrial applications using atomistic models and molecular dynamics simulations.

DATA SCIENCE PROJECTS

- Sentiment Analysis of COVID-19 Vaccines Based on Twitter Data. 
 - * Mined 42,478 unique tweets filtered by few predetermined keywords.
 - * Processed tweet metadata followed by stemming and lemmatization.
 - * Performed sentiment analysis to find positive/negative/neutral tweets.
 - * Visualized findings with geolocation filters in Tableau dashboard. 
- Predictive Modeling of Trading Decisions for Global Stock Exchange. 
 - * Utilized real market data consisting 2.39M tradings and 130 features.
 - * Trained multiple FFNN models to minimize loss and maximize AUC.
 - * Achieved high utility score (weighted ROI) testing on future data.
 - * Received bronze medal in the associated Kaggle competition (2021).
- 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 the 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).
- Cancer Classification & Clustering from Gene Expression Monitoring 
 - * 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 the 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.

RELATED COURSEWORK

Big Data and Cloud Computing

Data Mining and Analysis

Neural Networks

Applied Linear Models

Statistical Theory

Genomic Data Analysis

Design and Analysis of Experiments

EDUCATION

Ph.D. Mechanical Engineering

Washington State University  Aug 2022

Multiscale probabilistic (Monte Carlo) modeling, molecular dynamics simulations

M.S. Statistics

Washington State University  Jan 2022

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

B.S. Mechanical Engineering

BGD U. of Engg. and Tech.  Feb 2017

TECHNICAL SKILLS

Languages: Python R SQL MATLAB

C C++ SAS Fortran Bash

Databases: MySQL PostgreSQL

Libraries/Frameworks: SciPy Numpy

Pandas Matplotlib Seaborn Plotly



Scikit-learn TensorFlow Keras

PyTorch Spark dplyr tidyverse



tidyr caret quanteda ggplot2

Tools: Git Tableau AWS/EC2

AWARDS/HONORS

- Received Kaggle Competition Expert (ranked within the top 1%) badge, 2021.
- Bronze medal (top 8%), Kaggle Jane Street market prediction competition, 2021. 
- 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

- Python Data Scientist (DataCamp) 
- Deep Learning Specialist (deeplearning.ai) 
- Machine Learning (Stanford University) 