

## EDUCATION

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### B.Sc. in Computer Science and Engineering

Dhaka, Bangladesh

North South University, GPA- 3.51/4.0, Last 40 credits GPA - 3.74/4.00 , Distinction: Cum Laude

2013–2018

#### RELEVANT COURSES:

- Data Mining, Artificial Intelligence, Scientific Reasoning, Algorithm Design & Analysis, Numerical Methods, Software Engineering, Operating Systems, Internet & Web Technology, Engineering Mathematics , Probability & Statistics, Computer Architecture.

## RESEARCH EXPERIENCE

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### Machine Learning Engineer

May,2019-

Bkash

Supervisor: Mr. Ariful Hossain

#### PROJECTS:

- Visual Document Understanding Using Vision Transformers and Transfer Learning  
Designed and implemented a document information extraction system by using **transfer learning** and fusing multiple **synthetic data generation** techniques. Implemented a 4-stage **distributed training** process and real-time inference via **REST apis** ensuring maximum **GPU utilization**. Achieved SOTA **92% character-level accuracy** for Bengali KIE task.
- Graph Analytics  
Used **random walk** based graph representation learning techniques(DeepWalk, node2vec and graphSAGE) to generate node embeddings on large transaction graphs. Settled on **graphSAGE** and improved churn prediction true positive rate by **7%** and fraud detection by **4%**.  
Separately, Used Louvain Community Detection algorithm to detect **50+ financial fraud rings** and custom neo4j cypher queries to flag **1000+ suspects**.
- Deep Probabilistic Modelling for Customer Lifetime Value Prediction  
Used deep probabilistic modelling on customers' past transaction behavior to predict their future lifetime value(ltv). Used a method proposed by [Google Research](#) and modelled LTV as a '**zero-inflated lognormal**' distribution. My model's predictions enabled more targeted marketing campaigns.
- Income Score Calculation  
Designed and Implemented income score calculation by encoding inequality with **Gini index** weighted by **Maslow's Hierarchy of Needs** for automated, collateral free loan disbursement.
- Causal Inference  
Used **causal inference** on promotional campaigns and customers' subsequent behavior. In absence of expensive randomized control trials, this allowed us to evaluate the **Conditional Average Treatment Effect** of past campaigns and reduce budget waste by **14%** by optimizing user messaging and promotional campaigns.
- Topic Modeling(NLP)  
Used **LDA based Short-Text Topic Modelling** to analyze mixed-language reviews of the app to identify recurring issues and correlate them with release versions. Used libraries like **Spacy, Gensim, pyLDAvis**.
- Pipeline Orchestration and Experiment Management  
Used **Apache Airflow** to orchestrate Machine Learning pipelines and integrated with **Hadoop File System**. Ensured scheduled execution and continuous monitoring of training/inference of multi-million(**usually 30-50**

million+) data points. Implemented **MLFlow** to **track model performance metrics** and experiment results. Implemented **slack & mail alert system** for training failures.

– **Event Time Prediction**

Developed an effective and accurate Event Time Prediction system using the **Survival Analysis** framework. Used **Deep Learning** to predict multiple business-critical metrics( e.g. first transaction time for new users and loan instalment repayment time) with more than **85% accuracy** (based on brier score)

– **Personalized Recommendation(Ongoing):**

Developing a personalized offer recommendation system using the **Multi Armed Bandit** framework and **Thompson Sampling** that takes “**Equity of Exposure**” into account. Recommendations to be served in real-time.

## Research Assistant

2017-2018

Database and Information Systems Group, North South University ([Group's Page](#))

Supervisor: Dr. Mohammad Rashedur Rahman ([Supervisor's Page](#))

### PROJECTS:

– **Land cover change detection from satellite imagery**

Used unsupervised clustering on satellite imagery and spectral response patterns to detect land cover change of the city of Dhaka over a period of three decades.

We evaluated clustering algorithms like K-Means and DBSCAN on pixel values and verified them with ground truth labels to derive the change in land usage.

– **Time-series classification with neuro-fuzzy models**

Investigated applicability of adaptive neuro-fuzzy approaches to a complex time-series classification task, specifically- detected flux signatures of exoplanet systems from Kepler telescope data.

We used dynamic time warping distances to known positive cases to generate additional features, which improved the accuracy of the classifier but wasn't able to beat existing best performing models .

## PUBLICATIONS

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- [1] **R. M. Asif Amin**, A. Talha Khan, Z. T. Raisa, N. Chisty, S. Samiha Khan, M. S. Khaja, and R. M. Rahman, “Detection of exoplanet systems in kepler light curves using adaptive neuro-fuzzy system”, in *2018 International Conference on Intelligent Systems (IS)*, 2018, pp. 66–72.
- [2] F. R. Wasee, **R. M. Asif Amin**, Z. T. Raisa, S. Chowdhury, T. N. Alam, and R. M. Rahman, “Satellite image based characterization for monitoring urbanization and land cover change”, *International Journal of Networked and Distributed Computing*, vol. 7, pp. 1–10, 1 2018, ISSN: 2211-7946.

## PROJECTS

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- **Visual Factoid Question Answering System** ([Supervisor's Page](#)) (Capstone Project) 2018

Built an embedded system (based on a Raspberry Pi) that integrates cloud-based ML services to extract Bengali text(written or printed) from paper and answers factoid questions by translating and and fetching response from a knowledge-base.

- **“Q” - A human queue management system** ([Supervisor's Page](#)) 2018

A human queue management system inspired by queue management algorithms in Computer Science. Developed with PHP, html, CSS and Hosted on a Raspberry Pi, serving a queue can be done by just plugging in to power.

- **Travel-Insight** 2017

Built an android app that interfaces with device's GPS Sensor and sends the co-ordinates via SMTP protocol for traffic condition analysis.

## SKILLS

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- **Programming Languages:** Python, Java, SQL, C, Neo4j Cypher
- **Libraries and Frameworks:** Pytorch, Tensorflow, Keras, Pytorch Geometric, Pandas, Numpy, Scikit-learn, XGBoost, LightGBM, Scipy, Seaborn
- **Experiment Orchestration and Tracking:** Apache Airflow, Mlflow Tracking, FASTAPI, Docker, Nginx , Dask
- **Other Tools:** Git, Jupyter, Hadoop File System, Conda, Jira
- **Human Languages:** English- Excellent, Bengali- Native.

## STANDARDIZED TESTS

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- IELTS: 8/9  
*Reading: 8.5/9, Listening: 9/9, Speaking: 7/9, Writing: 8/9*
- GRE: 327/340  
*Verbal: 163/170, Quant: 164/170, AWA: 4/6*