Farhan Tanvir

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Education

Oklahoma State University (OSU) **Aug. 2019 - Aug 2023**
PhD in Computer Science, 3.81/4.00 *Stillwater, Oklahoma*

Relevant courseworks: Machine Learning, Big Data Management, Big Data Analytics, Data Structures and Algorithms Analysis 2.

Islamic University of Technology (IUT) **Jan. 2012 - Dec. 2015**
Bachelor of Science in Computer Science and Engineering, *Dhaka, Bangladesh*

Relevant courseworks: Calculus (I-IV), Data Structures and Algorithms, Introduction to Database Management Systems, Machine Learning, Relational Database Management System.

Experience

Graduate Research and Teaching Assistant **Aug 2019 - Current**
Oklahoma State University *Stillwater, Oklahoma*

- Authored a paper on DDI prediction, which is accepted in IEEE CIBCB 2021. Tasks include collecting, analyzing and interpreting large datasets, developing machine learning models and performing data management tasks.
- Conducting a study on DDI prediction using heterogeneous graph neural networks, a critical issue and a major driver of drug related death in US.
- Conducting a study on Using Precision Medicine for Safe Drug Recommendation using heterogeneous graph neural networks.
- Taught discrete math, database management and C/C++ programming in a freshman and sophomore class containing 50+ students.

Software Engineer **Jul. 2018 - Jul. 2019**
Impulse (BD) Ltd *Dhaka, Bangladesh*

- Developed 40% of two modules (payment, payment refund) of Event Management System built in ASP.NET.
- Communicated with clients of foreign companies for 1 year which enhanced communication skill.

Software Developer **Apr. 2016 - Jul. 2018**
DataSoft Systems Bangladesh Ltd *Dhaka, Bangladesh*

- Implemented 10% of ERP solution (consisting of 26 modules) built in ASP.NET MVC and entity frameworks resulting in $15000 funding and bonus from BIGM. Project website: http://www.bigm.edu.bd
- Performed various tasks including developing dashboard for data visualization, CMS and website, testing software, supervising subordinates in designated task and maintain stakeholder's interaction.

Publications

Journal Papers

- **Farhan Tanvir**, Khaled Mohammed Saifuddin, Muhammad Ifte Khairul Islam, and Esra Akbas, "Meta-Path Based Approach for DDI Prediction", *IEEE/ACM Transactions on Computational Biology and Bioinformatics (TCBB)* . **2022**

- Muhammad Ifte Khairul Islam, **Farhan Tanvir**, Ginger Johnson, Esra Akbas and Mehmet Emin Aktas, "Proximity-Based Compression for Network Embedding", *Frontiers in Big Data*, 2020.
  DOI: **10.3389/fdata.2020.608043** **2020**

Conference Papers

- **Farhan Tanvir**, Khaled Mohammed Saifuddin, and Esra Akbas, "DDI Prediction via Heterogeneous Graph Attention Networks", *21st International Workshop on Data Mining in Bioinformatics (BIOKDD).*
  DOI: **2207.05672** **2022**

- Khaled Mohammed Saifuddin, **Farhan Tanvir**, and Esra Akbas, "HyGNN: Drug-Drug Interaction Prediction via Hypergraph Neural Network", *IEEE International Conference in Data Engineering (ICDE).*
  DOI: **2206.12747**

- **Farhan Tanvir**, Muhammad Ifte Khairul Islam, and Esra Akbas, "Predicting Drug-Drug Interactions Using Meta-path Based Similarities", *2021 IEEE Conference on Computational Intelligence in Bioinformatics and Computational Biology (CIBCB)*, Melbourne, Australia, 1–6 (2021).
  DOI: **10.1109/CIBCB49929.2021.9562802** **2021**

- Bri Bumgardner, **Farhan Tanvir**, Khaled Mohammed Saifuddin and Esra Akbas, "Drug-Drug Interaction Prediction: a Purely SMILES Based Approach", *IEEE International Conference on Big Data*, 2021.
  DOI: **10.1109/BigData52589.2021.9671766**

Relevant Projects

Drug Repurposing For Precision Medicine | *Python, Pytorch, Tensorflow, Pandas, Numpy* **June. 2022 - Current**

- Conducting a study on Using Precision Medicine for Drug Repurposing using heterogeneous graph neural network. This study takes into account drug information and its interaction with other biomedical entities like genes and diseases.

DDI Prediction | *Python, Pytorch, Tensorflow, Pandas, Numpy* **Mar. 2020 - May 2022**

- Conducting multiple studies for DDI Prediction and Polypharmacy Side Effect Prediction. Each of these studies consider drug information and its interaction with other biomedical entities.
- For DDI prediction, these studies undertook various approaches including heterogeneous information network, heterogeneous graph neural network, hypergraph and hypergraph neural network.

Network Embedding | *Python* **Aug 2019 - Dec 2020**

- proposed a novel graph compression method based on the neighborhood similarity that compresses the input graph to a smaller graph with incorporating local proximity of its vertices into super-nodes.
- employed the compressed graph for network embedding instead of the original large graph to bring down the embedding cost and also to capture the global structure of the original graph

Technical Skills

Programming Languages C, C++, Python, Java, Android.
Web Language HTML, CSS, JavaScript.
Statistical Analysis Predictive Modeling, Machine learning, Deep Learning, Data Cleaning, Analyzing and Visualization, and Time-series Analysis.
ML/DL Tools TensorFlow, Pytorch, Keras, Caffe2, Scikit-learn, Pandas, Numpy, SciPy, Matplotlib, GraphX, NetworkX, and DGL (Deep Graph Library).
Big Data Application Hadoop, Apache Kafka, Apache Flume, HiveQL, HBase, MapReduce, Hive.

Awards and Achievements

- Outstanding Graduate Researcher Award 2022 from Dept. of Computer Science, Oklahoma State University
- Outstanding Graduate Student Leadership Award 2022 from Dept. of Computer Science, Oklahoma State University
- Computer Science Fellowship from Dept. of Computer Science, Oklahoma State University
- OIC Scholarship from Islamic University of Technology, Bangladesh.