T. M. Tariq Adnan
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[Google Scholar] [GitHub]

Research Interest

- Big Data Analytics
- Data Mining
- Distributed Systems
- Social Networks
- Deep Learning
- Bioinformatics

Education

- **Bangladesh University of Engineering and Technology (BUET)** Dhaka, Bangladesh
  M.Sc. in Computer Science and Engineering; CGPA: 3.92/4.0 October 2017 - February 2021
- **Bangladesh University of Engineering and Technology (BUET)** Dhaka, Bangladesh
  B.Sc. in Computer Science and Engineering; CGPA: 3.95/4.0 February 2013 - September 2017
  Ranked **3rd** in a class of 150 students
  Thesis Title: *Fast, Scalable and Geo-Distributed PCA Algorithm for Tall and Wide Big Data Analytics*

Work Experience

- **Bangladesh University of Engineering and Technology (BUET)** Dhaka, Bangladesh
  Assistant Professor, Department of CSE, BUET May 9, 2021 - Present
- **Bangladesh University of Engineering and Technology (BUET)** Dhaka, Bangladesh
  Lecturer, Department of CSE, BUET July 3, 2018 - May 9, 2021
- **Bangladesh University of Engineering and Technology (BUET)** Dhaka, Bangladesh
  Graduate Research Assistant, Department of CSE, BUET October, 2017 - March, 2018

Research Experience

- **Fast, Scalable and Geo-Distributed PCA for Big Data Analytics**
  - Taken advantage of the **zero-noise-limit** Probabilistic PCA model, and introduce a **block-division** method for it in order to suppress the explosion of intermediate data efficiently.
  - Proposed a communication efficient solution in the geo-distributed environment.
  - The proposed algorithm is referred to as **TallnWide**, and empirical evaluation with real datasets shows that TallnWide can successfully handle significantly higher dimensional data (**10**×) than existing methods, and offer up to **2.9**× improvement in running time in the geo-distributed environment compared to the conventional approaches.

  Supervisor: Dr. Muhammad Abdullah Adnan **Status**: Published in Information Systems

- **UACD: A Local Approach for Identifying the Most Influential Spreaders in Twitter in a Distributed Environment**
  - Proposed a novel method of identifying the most influential spreaders on Twitter social network by incorporating the **user-specific information** (extracted from his/her Twitter account) to the topological information.
  - Provided a **distributed implementation** of our proposed algorithm on the `Amazon EC2` and observe that the algorithm is **scalable** and can process a significantly large network.

- Compared the ranking generated by UACD with that of the existing methods using widely accepted metrics of ranking comparison and the experimental results indicate that UACD is **12.5**% (on average) more accurate and can produce the result in **175**× less time in comparison to the existing methods.

Supervisor: Dr. Muhammad Abdullah Adnan **Status**: Under review at SNAM

- **Hierarchical Attention for Host Intrusion Detection**
  - Proposed a novel hierarchical attention based deep learning method of detection intrusion on a host.
  - Evaluated the model on ADFA-LD dataset, which is a collection of a trace data of Linux system calls.
  - With proper tuning of hyper-parameters, the proposed method successfully outperforms the existing methods in terms of accuracy as well as lower false alarm rate.

Supervisor: Dr. Shohrab Hossain **Status**: Preprint

- **Protein Function Prediction using Multi-Layer CNN**
  - This study is targeted to develop a highly accurate method for predicting protein functions which incorporates a novel **hierarchical multi-layer convolutional neural network (CNN)**.
  - The proposed model is capable of effectively capturing the **long-range interactions** among the amino acid residues.
  - The proposed model have been evaluated using **CAFA3** and **Uniprot** dataset.

Supervisor: Dr. Shamsuzzoha Bayzid **Status**: Preprint

Publications

- **TM Tariq Adnan**, Md Mehrab Tanjim, and Muhammad Abdullah Adnan. "Fast, scalable and geo-distributed PCA for big data analytics". Elsevier Journal on Information Systems, Elsevier, Vol 98, Article 101710, 2021. [Paper] [Code]
- **TM Tariq Adnan**, Md. Saiful Islam, Md. Tarikul Islam Papon, Sourav Kumar Nath, Muhammad Abdullah Adnan. "UACD: A Local Approach for Identifying the Most Influential Spreaders in Twitter in a Distributed Environment". Submitted for review at Social Network Analysis and Mining (SNAM) in April, 2021.

Teaching Experience (Selected)

- **CSE 453**: High Performance Database System (January 2019)
- **CSE 215**: Database Sessional (January 2020)
- **CSE 315**: Microprocessors and Microcontrollers (January 2018)
- **CSE 391**: Embedded Systems and Interfacing (January 2021, January 2019)
- **CSE 204**: Data Structure and Algorithm II Sessional (July 2018)
- **CSE 110**: Programming Language Sessional (January 2020, January 2018)

Technical Skill

- **Programming Languages**: Python, C, C++, Java, Assembly Language (8086), Prolog, PL/SQL
- **Database**: mySQL, Oracle, PostgreSQL
- **Frameworks**: Keras, Tensorflow, DJango, Spring Boot, React, Laravel
- **Others**: Hadoop MapReduce, Apache Spark, Scala

Extra Curricular Activities

- **Member of Organizing Committee**

  International Conference on Networking Systems and Security (NSysS), organized by Department of CSE, BUET (2018, 2019, 2020)

- **Coach**

  BUET International Collegiate Programming Contest (ICPC) Teams (2018, 2019, 2020)

- **Team Leader and Member**

  Departmental class test scheduling committee (2018-up to date)

Honors and Awards (Selected)

- Dean's Award in each academic year in BUET for academic result
- University Merit Scholarships in each semester in BUET for academic result
- University Scholarship for Best Project in July-2016 semester

Academic Projects (Selected)

- **Sudoku Solving Game**
  A graphical classic sudoku puzzle solving game developed using C.
- **Download Manager**
  A file download manager developed using Java, which tries to increase the download speed by partitioning the file and download concurrently.
- **School Management System**
  A web application that manages academic events of a school. The app was developed using Laravel and mySQL.
- **Coin Sorting Machine**
  An automated device that sorts different valued Bangladeshi coins. Thw project was developed using Arduino, Load Cell with Amplifier, multiple motors etc. It was awarded the Best Project Award. [Weblink]

Reference

- **Dr. Muhammad Abdullah Adnan**
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  [Google Scholar Profile]
- **Dr. Md. Shamsuzzoha Bayzid**
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  [Google Scholar Profile]