Munawara Saiyara Munia

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Research Interest

Deep Learning, Machine Learning, Healthcare Informatics.

Focus: Designing computational frameworks based on deep learning techniques to tackle research problems related to neurological disorders, such as Epilepsy.

Education

Ph.D. in Computer Engineering Aug 2019 – Present
The University of Texas at Dallas, Texas, USA
Advisor: Mehrdad Nourani

M.Sc. in Computer Science Aug 2017 – May 2019
The University of Texas at Dallas, Texas, USA

B.Sc. in Computer Science and Engineering Apr 2012 – Jun 2016
Ahsanullah University of Science and Technology,
Dhaka, Bangladesh

Professional Experience

Trainee Engineer Jan 2017 – Aug 2017
IQVIA (formerly Quintiles and IMS Health), Dhaka, Bangladesh
Mining and analyzing data from pharmaceutical companies and provide useful insight of the data, develop automated reporting services for various clients using SSIS and SQL Server.

Android Application Developer Intern Aug 2016 – Nov 2016
bdjobs.com, Dhaka, Bangladesh
Designing and developing dynamic interactive android application, working on cutting edge Android technology.

Publications

1. Khaleque Md. Aashiq Kamal, Mahmoud Alfadel & **Munawara Saiyara Munia** on "A Study on Digital Forensics Tools: Comparing Left Artifacts and Processing Time", International Workshop on Computational Intelligence (IWCI 2016), Dhaka, Bangladesh.
2. **Munawara Saiyara Munia,** Shaimon Rahman Noman, Samira Samrose on "False Alarm Rate Reduction using Hybrid Model in Network Anomaly Detection", International Journal of Computer Applications, Volume 174 – Number 8, Year of Publication: 2017
3. **Munawara Saiyara Munia,** Mehrdad Nourani & Sammy Houari on "Biosignal Oversampling Using Wasserstein Generative Adversarial Network", 8th IEEE International Conference on Healthcare Informatics (ICHI), 2020, Oldenburg, Germany **[Best Student Paper Award]**.
4. **Munawara Saiyara Munia,** Seyyed MohammadSaleh Hosseini, Mehrdad Nourani, Jay Harvey, Hina Dave on "Imbalanced EEG Analysis Using One-shot Learning with Siamese Neural Network", 9th IEEE International Conference on Healthcare Informatics (ICHI), 2021, Victoria, Canada.

Manuscripts Under Preparation

1. **Munawara Saiyara Munia,** Mehrdad Nourani, Jay Harvey, Hina Dave on "Seizure Onset Pattern Analysis Using Symbolic Aggregate Approximation and Unsupervised Representation Learning", 2021.
2. **Munawara Saiyara Munia,** Mehrdad Nourani, Jay Harvey, Hina Dave on "Localizing Epileptic Seizure Onset Zone Based on Cluster Analysis in sEEG Recordings", 2021.
3. **Munawara Saiyara Munia,** Mehrdad Nourani, Jay Harvey, Hina Dave on "Epileptic Seizure Onset Focus Localization for Patients with Temporal Lobe Epilepsy Using Graph Convolutional Neural Network", 2021.

Honors and Awards _____

1. **Scholarship Recipient**, Grace Hopper Celebration Scholar, 2021.
2. **IEEE Best Student paper Award**, ICHI 2020.
3. **Dean's List of Honor**, Ahsanullah University of Science and Technology (2012-2016).
4. **Education Board Scholarship (Talent Pool)**, awarded by the 'Ministry of Education, Bangladesh' for outstanding result in Higher Secondary Certificate (HSC) Examination. *Stood* ***22nd*** among the HSC examinees of Chittagong Board, 2011.
5. **Education Board Scholarship (Talent Pool)**, awarded by the 'Ministry of Education, Bangladesh' for outstanding result in Secondary School Certificate (SSC) Examination, 2009.

Selected Projects _____

Biosignal Oversampling Using Wasserstein Generative Adversarial Network
The objective of this project is to generate synthetic Biosignal for data augmentation, in order to address the imbalanced classification problem in many Biomedical applications. The system has successfully been able to generate synthetic Biosignal data using state of the art Generative Adversarial Network. **Technologies Used:** Python, Keras.

Imbalanced EEG Analysis Using One-shot Learning with Siamese Neural Network
The objective of this project is to build a seizure detection system which can reliably detect seizures by learning from a very small number of ictal samples. The system extracts 1D Local Binary Pattern (LBP) codes for each channel of the EEG signal and uses a Siamese CNN network for learning and classifying between the seizure and non-seizure data. I have successfully achieved an average Sensitivity of 87.96%. **Technologies Used:** Python, Keras.

CAMEO-verb-ontology-extension
The objective of this project is to identify verbs or actions between two political entities which are not captured by PETRARCH or any other CAMEO ontology driven event coder. **Technologies Used:** Python, Stanford CoreNLP, NLTK.

False alarm reduction in Anomaly detection using hybrid classifier in Network Intrusion Detection System (Undergrad thesis)
The objective was to propose a novel hybrid Network Anomaly Detection System using data mining algorithms such as Naïve Bayes, K-Means and K-Nearest Neighbors. It could efficiently reduce false alarm rate, resulting in an accuracy of 95.6%. **Technologies Used:** MATLAB, Weka, Scikit-Learn

Technical Skills _____

Programming Languages: Python, C, C#, Java, R, SQL, MATLAB.
Libraries: Keras, Pytorch, Pandas, Numpy, Stanford CoreNLP, NLTK.

Teaching Experience _____

Teaching Assistant, **The University of Texas at Dallas** (Aug 2017-Present)

- Teaching Assistant, Computer Architecture (SE 3340), Fall 2017.
- Teaching Assistant, Operating Systems Concepts (CS 5348), Spring 2018.
- Teaching Assistant, Automata Theory (CS 4384), Summer 2018.
- Teaching Assistant, C/C++ programming in UNIX Environment (CS 3377), Summer 2018.
- Teaching Assistant, Software Architecture and Design (SE 4352), Fall 2018.
- Teaching Assistant, Software Defined Network (CS 6301), Spring 2018, Spring 2019.
- Teaching Assistant, Introduction to Digital Systems (CE 2310), Fall 2019, Spring 2020, Fall 2020.
- Teaching Assistant, Introduction to Electrical Engineering II (CE 1202), Fall 2020, Spring 2021.

Relevant Coursework _____

Machine Learning, Artificial Intelligence, Statistical Methods for Data Science, Design and analysis of Computer Algorithms, Computer Vision, Pattern Recognition, Natural Language Processing.