MD MARUFI RAHMAN

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RESEARCH INTEREST

Artificial intelligence, Computer vision, Image processing

EDUCATION

Doctor of Philosophy in Computer Science and Engineering August 2019 - present
University of North Texas
Denton,Texas, CGPA: 3.82/4.00

Bachelor of Science in Electronics and Telecommunication Engineering March 2013 - Dec 2017
Rajshahi University of Engineering and Technology.
Rajshahi,Bangladesh, CGPA: 3.32/4.00

EXPERIENCE

Graduate Teaching Assistant Aug 2019- present
I have worked as a teaching assistant for courses CSCE5390 (multimedia computing), CSCE5350 (fundamentals of databases), CSCE5050 (Application of Cryptography), CSCE4355 (Database Administration), CSCE2110 (computing foundation), CSCE1030(programming and problem solving using C++). My responsibility was grading, proctoring for exams, mentoring, and helping students with coursework.

Graduate Research Assistant Aug 2020- May 2022
I have worked with my doctoral supervisor Dr.Oh on solving different image analysis challenges for the gastrointestinal videos dataset. My responsibility here was to solve and generate new ideas for medical image analysis with image processing techniques and deep learning methods.

Graduate Teaching Fellow May 2020- Aug 2020
My responsibility was teaching Undergraduate students the Fundamentals of Database Systems course(CSCE 4350). I was the summer instructor for this course.

House Tutor Jul 2018- Aug 2019
My responsibility was mentoring students for the Undergraduate Admission Test concentration on mathematics and physics preparation. I especially taught Probability, Geometry, Calculus, Matrices, electromagnetism, and optics to twelfth-grade students based on the national curriculum syllabus.

Undergraduate Research Assistant Dec 2016- Jul 2018
My responsibility was to implement new ideas for the project "Design and analysis of transcranial magnetic coils to stimulate brain neurons for various neurological disorders."

PUBLICATIONS

(1) **M. M. Rahman**, JH Oh, Wallapak Tavanapong, Johnny Wong and Piet C. de Groen, "Automated Bite-block Detection to Distinguish Colonoscopy from Upper Endoscopy using Deep Learning", *2021 16th International Conference on Visual Computing (ISVC)*, virtual, 2021, pp. 216-228.

(2) **M. M. Rahman**, M. K. Hosain, S. Ahmed and M. W. Al Azad, "Deep Transcranial Magnetic Stimulation Using Center Dense and Center Sparse Double Cone Coil on Realistic Head model", *2018 International Conference on Computer, Communication, Chemical, Material and Electronic Engineering (IC4ME2)*, Rajshahi, 2018, pp. 1-4.

(3) **M. M. Rahman**, M. K. Hosain, S. Ahmed and M. W. A. Azad, "Investigation of coil designs for transcranial magnetic stimulation on realistic head model"", *2017 IEEE Region 10 Humanitarian Technology Conference (R10-HTC)*, Dhaka, 2017, pp. 279-283.

(4) **M. M. Rahman**, J. R. Mou, K. Tara and M. I. Sarkar, "Real time Google map and Arduino based vehicle tracking system", *2016 2nd International Conference on Electrical, Computer Telecommunication Engineering (ICECTE)*, Rajshahi, 2016, pp. 1-4.

TECHNICAL SKILLS

Programming Skill	C plus plus, Python, R, Matlab, SQL
Framework and Tools	Tensorflow, Keras,Pythorch, OpenCV, NLTK, Pandas, Numpy, Scikit learn, Scipy
Cloud Platform	GCP
Application Software	Expert on Microsoft Office TM

PROJECT WORKS

- **Integrating multi-omics and prior biological data to predict Colorectal cancer cells using Single Cell Trio-seq data :** Several studies have predicted cancer cells from Single Cell RNA-seq (scRNA-seq) data; however, using only gene expression or DNA methylation data individually and without biological relevance. Here we have built deep learning models integrating gene expression and DNA methylation data and biological information such as Protein-Protein Interaction (PPI) and Protein-DNA Interaction (PDI) and KEGG pathway to predict colorectal cancer cells from tumors and their metastases precisely

- **Similarity detection of colonoscopy medical images using depth map :** A similarity measure based on these features is not effective for some type of images, for example, colonoscopy images captured from colonoscopy procedures. This is because the low-level visual features of these images are mostly very similar. We propose a new method to compare these images and find their similarity in terms of their surface structures.

- **Distinguishing Colonoscopy from Upper Endoscopy using Deep Learning :** One of the fundamental steps for the automated quality feedback system is to distinguish a colonoscopy from an upper endoscopy since upper endoscopy and colonoscopy procedures are performed in the same room at different times, and it is necessary to distinguish the type of a procedure prior to execution of any quality measurement method to evaluate the procedure. In upper endoscopy, a bite-block is inserted for patient protection. By detecting this bite-block appearance, we can distinguish colonoscopy from upper endoscopy. However, there are various colors (i.e., blue, green, white, etc.) of bite-blocks. Our solution utilizes analyses of Hue and Saturation values and two Convolutional Neural Networks (CNNs).

GRADUATE COURSES

Programing languages, **Deep learning**, **Multimedia Computing**, Bio Computing, Parallel and Distributed Database, **Feature Engg.**,Design and Analysis of Algorithm,Human/Machine Intelligence, Machine Learning for Precision in Medicine, **Empirical Analysis**

UNDERGRADUATE COURSES

Design and Analysis of Signal and Systems Using MATLAB, **Data structure**, **C programming**, VLSI Design, **Numerical Methods in Engineering**, Digital Signal Processing, **Digital image processing**, **Engg. Mathematics- I(Differential calculus, Integral calculus, Matrix)**, **Engg. Mathematics-II(Ordinary differential equations, Partial differential equations, Series solution, Co-ordinate geometry)**, **Engg. Mathematics-III- (Vector analysis, Fourier analysis, Laplace transforms)**, **Engg. Mathematics-IV(Complex Variable, Statistical Analysis)**, Microprocessor and Microcomputer,

REFERENCE

(will provide upon request)