Sheikh Muhammad Saiful Islam

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Google Scholar Profile

Research Interests

- Artificial Intelligence, Generative AI, Machine Learning, Deep Learning, Medical Imaging, Genomics, Imaging Genetics, Neurological Disease, Cancer

Education

University of Texas Health Science Center at Houston — Houston, USA
Ph.D. Candidate in Biomedical Informatics, Advisor: Dr. Degui Zhi — january,2020–Current

University of Dhaka — Dhaka, Bangladesh
M.S. in of Pharmaceutical Chemistry, 3.82 out of 4.0 — 2007–2008 (Passing Year: 2009)

University of Dhaka — Dhaka, Bangladesh
B.S. in Pharmacy, 3.82 out of 4.0 — 2004–2007 (Passing Year: 2008)

Employment

University of Texas Health Science Center at Houston — Houston, USA
Graduate Research Assistant at Dr. Zhi's Lab — January 2020 - Present

Manarat International University — Dhaka, Bangladesh
Lecturer, Department of Pharmacy, OnStudy Leave — 13 June, 2015 - 01 January,2020

Incepta Pharmaceuticals Pharmaceuticals Limited — Dhaka, Bangladesh
Senior Officer, Research and Development Department — 20 July, 2010 - 30 May, 2015

Publications

[1] K. Patel, Z. Xie, H. Yuan, I. S. M. S. Islam, Y. Xie, W. He, W. Zhang, A. Gottlieb, H. Chen, L. Giancardo, *et al.*, "Unsupervised deep representation learning enables phenotype discovery for genetic association studies of brain imaging", *Communications Biology*, vol. 7, no. 1, p. 414, 2024.

[2] M. A. Hossain, **Islam, Sheikh Muhammad Saiful**, T. A. Asa, M. S. Hussain, M. R. Rahman, A. Moustafa, and M. A. Moni, "Identification of genetic links of thyroid cancer to the neurodegenerative and", in *Proceedings of International Joint Conference on Computational Intelligence: IJCCI 2019*, Springer Nature, 2020, p. 263.

[3] **Islam, Sheikh Muhammad Saiful**, Z. Xie, and D. Zhi, "Cancer classification from gene expression using graph attention network and", in *International Conference on Intelligent Biology and Medicine: ICIBM 2022*, 2020.

[4] M. A. Hossain, T. A. Asa, **Islam, Sheikh Muhammad Saiful**, M. S. Hussain, and M. A. Moni, "Identification of genetic association of thyroid cancer with parkinsons disease, osteoporosis, chronic heart failure, chronic kidney disease, type 1 diabetes and type 2 diabetes", in *2019 5th International Conference on Advances in Electrical Engineering (ICAEE)*, IEEE, 2019, pp. 832–837.

[5] M. A. Hossain, **Islam, Sheikh Muhammad Saiful**, J. M. Quinn, F. Huq, and M. A. Moni, "Machine learning and bioinformatics models to identify gene expression patterns of ovarian cancer associated with disease progression and mortality", *Journal of biomedical informatics*, vol. 100, p. 103 313, 2019.

[6] S. Abdullah, M. M. Hasan, and **Islam, Sheikh Muhammad Saiful**, "Yolo-based three-stage network for bangla license plate recognition in dhaka metropolitan city", in *2018 International Conference on Bangla Speech and Language Processing (ICBSLP)*, IEEE, 2018, pp. 1–6.

[7] **Islam, Sheikh Muhammad Saiful** and M. M. Hasan, "Deepgonet: Multi-label prediction of go annotation for protein from sequence using cascaded convolutional and recurrent network", in *2018 21st International Conference of Computer and Information Technology (ICCIT)*, IEEE, 2018, pp. 1–6.

Skills

- **Technical Skills:** Pharmaceutical Product Formulation, Stability Study, Analytical Method Developement of Phamraceutical Product, High Performance Chromatography, Nuclear Magnetic Resonance (NMR) spectroscopy,Ultraviolet–visible spectroscopy
- **Bio Statistics:** SPSS
- **Bioinformatics:** Single Cell Sequenceing, RNA Sequencing, NGI, Genome Wide Association Study,BLAST, FASTA and Phylogenetic tree
- **Computer Skills:** Microsoft Office (Excellent in MS word, PowerPoint and Excel)
- **Programming Language:** Python, R
- **Machine Learning Framework:** Scikit-Learn,Sci-py
- **Deep Learning Framework:** Pytorch, Keras, Tensorflow

Projects

Project Title: Develop a self-supervised deep learning framework to learn voxel representations of the brain from T1-weighted MRI, enabling the identification of genetic variations associated with specific brain regions.
Year: 2021- Current
Institution: D. Bradley McWilliams School of Biomedical Informatics.
Position: Graduate Research Assistant
Technology Used: Python programming language, Pytorch Deep Learning Framework, MONAI, FSL
Short Description: Development of voxel representation learning through self-supervised learning in order to perform regional GWAS as well as voxel based downstread tasks.

Project Title: Develop an unsupervised deep learning model that can identify genetic variations associated with the white matter, gray matter, cerebrospinal fluid from T1-weighted MRI, emphasizing the exploration of the evolving genomic patterns specific to these brain tissues.
Year: 2021- Current
Institution: D. Bradley McWilliams School of Biomedical Informatics.
Position: Graduate Research Assistant
Technology Used: Python programming language, Pytorch Deep Learning Framework, MONAI, FSL
Short Description: Unsupervised image phenotype derived from rgions of magnetic resoncance imaging using state-of-the-art deep learning methods to perform GWAS and investigate the dynamics of genomic pattern learning during training

Project Title: Develop an unsupervised deep learning model that can identify genetic variations associated with the brain from T1-weighted MRI with a focus on investigating the dynamics of genomic pattern discovery throughout the learning process.
Year: 2021- Current
Institution: D. Bradley McWilliams School of Biomedical Informatics.
Position: Graduate Research Assistant
Technology Used: Python programming language, Pytorch Deep Learning Framework, MONAI, FSL
Short Description: Unsupervised image phenotype derived from magnetic resoncance imaging using state-of-the-art deep learning methods to perform GWAS and investigate the dynamics of genomic pattern learning during training

Project Title: **Neurological Disease Bio marker Identification Through Deep Learning**
Year: 2022- 2023
Institution: D. Bradley McWilliams School of Biomedical Informatics.
Position: Graduate Research Assistant
Technology Used: Python programming language, Pytorch Deep Learning Framework, MONAI)
Short Description: Unsupervised endophenotype identication from magnetic resoncance imaging using state-of-the-art deep learning methods

Project Title: **Neurological Disease Associated Genomics Variant Discovery**
Year: 2023
Institution: D. Bradley McWilliams School of Biomedical Informatics. USA, Texas
Position: Graduate Research Assistant
Technology Used: Python programming language, Generative AI, Pytorch Deep Learning Framework, MONAI)
Short Description: Neurological disease associate Single Neucleotide variants identificaton through contrastive learning framework from magnetic resonance imaging and genomic profile

Project Title: **Pan Cancer Prediction from Gene Expression Signature**
Year: 2020-2021
Institution: D. Bradley McWilliams School of Biomedical Informatics.
Position: Graduate Research Assistant
Technology Used: Python programming language, Pytorch Deep Learning Framework)
Short Description: Predicting 33 types of cancers from gene expression profile using deep learning.

Project Title: **DEEPGONET: Multi-label Prediction of GO Annotation for Protein**
Year: 2018-2020
Institution: Manarat Internation University, Dhaka, Bangladesh
Position: Faculty at Department of Pharmacy
Technology Used: Python programming language, Keras Deep Learning Framework)
Short Description: Protein Sequence embedding was developed to classify proteins in GO annotations.

Project Title: **Diabetic Retionpath Detection**
Year: 2018
Institution: Manarat Internation University, Dhaka, Bangladesh
Position: Faculty at Department of Pharmacy
Technology Used: Python programming language, Keras Deep Learning Framework)
Short Description: Prediction of Diabetic retinopathy from retinal image using Deep Learning

Project Title: **Discovering Gene Expression Pattern Associated with Ovrian Cancer**
Year: 2018
Institution: Manarat Internation University, Dhaka, Bangladesh
Position: Faculty at Department of Pharmacy
Technology Used: Python programming language, Scikit-learn, R programing language)
Short Description: Elucidating Clinical and genomic factors associated with survival in Ovarian cancer

Scholarships and Awards

- James Turley Endowed Scholarship for Global Health Award 2023
- Doris Ross Scholarship 2021
- SBMI Dean's Excellence Scholarship 2019

Reference

- **Degui Zhi, PhD, MS**
  PhD Supervisor
  McWilliams School of Biomedical Informatics at UTHealth Houston
  Degui.Zhi@uth.tmc.edu
  Phone: 713-500-3629
- **Mohammad Ali Moni, PhD**
  Resarch Collaborator
  Bone Biology Divisions, Garvan Institute of Medical Research, Sydney, NSW 2010, Australia
  mohammad.moni@sydney.edu.au