TANZIRA NAJNIN

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EDUCATION

The University of Texas at San Antonio San Antonio, TX
Ph.D. in Computer Science (CGPA: 4.00 on a scale of 4.00) Aug 2018 – May 2024 (Expected)
Research area: Evaluation and analysis of disease outcome prediction using large-scale gene expression datasets.
Relevant coursework: Data Mining, Machine Learning, Artificial Intelligence, Bioinformatics, Algorithms.

PROFESSIONAL EXPERIENCE

The University of Texas at San Antonio *(Graduate Research Assistant)* Aug 2018 – Present

- Apply data preprocessing techniques to aggregate and visualize large-scale datasets.
- Design machine learning models for classification tasks.
- Evaluate model performance and conduct statistical significance testing.

Sylhet Metropolitan University, Bangladesh *(Lecturer)* Jan 2017 – Jul 2018

- Designed course materials, conducted lectures, moderated class discussions, and mentored students.

TECHNICAL SKILLS

- **Languages:** Python, MATLAB, Java, C/C++, R, SQL, NoSQL, Assembly, JavaScript.
- **Libraries:** Scikit-Learn, SciPy, Numpy, Pandas, Seaborn, Matplotlib, TensorFlow, PyTorch.
- **Tools:** Git, SLURM scheduler, Excel, Tableau, Google Colab, Bash, Cytoscape, LaTeX, Microsoft Project.

PROJECTS & PUBLICATIONS

A Novel Approach for Predicting Breast Cancer Metastasis. In submission | *Regression, Graph Analysis.*

- Built class-specific gene networks and applied the network differences to classify breast cancer metastasis.
- Outperformed state-of-the-art models including Random Forest, Multi-layer Perceptron, and SVM.
- Analyzed model interpretability and ability to explain and highlight underlying biology.

A Robust Personalized Classification Method for Breast Cancer Metastasis Prediction. Cancers 14.21 (2022): 5327. | *Random Forest, Logistic Regression*

- Built a logistic regression-based personalized breast cancer classification algorithm.
- Identified robust features and improved metastasis prediction AUC by as much as 3%.

CiFRUS: A Novel Numeric Data Augmentation Technique. In submission | *Supervised Learning*

- Designed an algorithm for augmenting high-dimensional numeric data and resolving class imbalance.
- Assessed post-augmentation performance of machine learning models using multiple metrics.
- Outperformed SMOTE and other state-of-the-art tools on a majority of 62 benchmarking datasets.

Non-Surgical Diagnosis of *Endometriosis* using Machine Learning: A Proof-of-Concept Study. In submission | *Feature Engineering, Ensemble Models*

- Developed an expression profile-based diagnosis tool for *endometriosis*, a surgically diagnosed disease.
- Achieved 99% prediction accuracy using an ensemble of random forest and support vector classifiers.

Image Classification, Facial Key Points Detection, and Text Classification. | *TensorFlow, CNN, Deep Learning, Transfer Learning, RNN, LSTM, GRU.* Sep 2021 - Dec 2021

- Applied transfer learning on pre-trained Xception model and achieved ~81% accuracy on the flower dataset.
- Implemented a CNN model for facial key points detection with ~75% accuracy on a kaggle image dataset.
- Trained and evaluated a DenseNet on the CIFAR-100 image classification dataset with ~78% accuracy.
- Designed a Deep Learning model for the Reuters newswire classification dataset with ~97% accuracy.

A Network-Based Approach for Improving Annotation of Transcription Factor Functions and Binding Sites in *Arabidopsis thaliana*. Genes 14.2 (2023): 282. | *Regression, Statistical Analysis, A/B Testing, Clustering.*

- Built a regulatory network from large-scale gene expression data using LASSO regression.
- Discovered novel functions for 63% and validated existing ones for 30% of the transcription factors.

LEADERSHIP AND AWARDS

- **CS Graduate Student Association, UTSA** *(Vice-president, Project Chair, Secretary)* Aug 2019 – Aug 2023
  Organized town hall meetings, alumni mentoring workshops, and social events.
- **Grad Cohort for Women (CRA-WP) Scholar** 2022
- **Grace Hopper Celebration (GHC) Scholar** 2020