IBNA KOWSAR

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Education

Tennessee State University [TSU] Tennessee
M.S. in Computer Science (Data Science Specialization) *2023 – 2025 (expected)*

- **Research Interests**: Machine Learning, Deep Learning, Self-supervised & Unsupervised Methods, Problem-solving for Tabular and Image Data

Brac University [BRACU] Bangladesh
B.Sc in Computer Science and Engineering *2017 – 2021*

- CGPA: 3.87/4.0 (Highest Distinction)
- Undergraduate Thesis : Facial Expression Recognition: Convolutional Attentional Masking Network and Ensemble Approach
  Supervisor: Md. Hasanul Kabir, PhD. Co-Supervisor: Rasif Ajwad

Professional Experience

Graduate Research Assistant Aug'2023 – Jun'2025
CIDA Lab, TSU

- Implementing and enhancing deep learning algorithms for tabular data
- Investigating Deep Learning-based strategies to enhance domain adaptation on image data

Machine Learning Engineer Jul'2021 – Jan'2023
Apurba Technologies Ltd.

- Enhanced and optimized existing Machine Learning systems to address challenges in Bengali OCR (Optical Character Recognition), Detection, and Layout Segmentation
- Deployed and handled Machine Learning models to the server using FastAPI

Lecturer Oct'2021 – Aug'2023
BRAC University

- Managed and mentored a diverse student body of over 150 each term while collaborating closely with fellow faculty to coordinate coursework
- Taught a range of courses including Introduction to Robotics (CSE461), System Analysis and Design (CSE471), Digital Logic Design (CSE260), and Database Systems (CSE 370)

Undergraduate Teaching Assistant Jan'20 – May'21
Programming Language I (Structured Programming) & II (OOP) *Java, Python*

- Created video tutorial on Object Oriented Programming in both Java Python
- Provided Consultation Hours for Problem Solving and Exam Preparation

Technical Skills

Languages and Frameworks: Python, Java, MySQL, Assembly (x86, 8051), PyTorch, Flask, FastAPI
Developer Tools and Libraries: Git, Bash Scripting, Pandas, OpenCV, Scipy, Matplotlib, Seaborn, Plotly, Tensorflow, Docker, AWS, Jupyter, Asana
Software and Design Environments: MATLAB, Simulink, Proteus, LabVIEW, Webots.
Hardware Description and Modeling Languages (HDLs): Verilog, VHDL

Publications and Preprints

Attention-based Imputation of Missing Values in Electronic Health Records Tabular Data
*The 12th IEEE International Conference on Healthcare Informatics(**ICHI 2024**)*

- A novel attention-based missing value imputation framework that learns to reconstruct data with missing values leveraging between-feature (self-attention) or between-sample attentions.

A Deep Learning Based Unified Solution for Character Recognition
*International Conference on Pattern Recognition(**ICPR 2022**)*

- Segmentation & Recognition of Bangla, Assamese and English (Handwritten, Typewritten, Computer Composed & Printed) characters using multi-headed CNN

Towards Building a Bangla Text Recognition Solution with a Multi-Headed CNN
*IEEE International Conference on Big Data(**IEEE BigData 2021**)*

- State-of-the-art Recognition of Bangla OCR (Handwritten, Typewritten, Computer Composed & Printed) characters
- Proposed a model that reduces the complexity of multi-class classification and classifies the characters using only a three-headed convolutional neural network.

A Novel Approach to Enhance Safety on Drowsy Driving in Self-Driving Car
*Mobile Networks and Applications (**Springer MONET 2022**)*

- Collected synthetic drowsy driving data and developed an algorithm for safe autonomous parking when detecting driver fatigue

An efficient Metaheuristic Approach for Finding Motifs from DNA Sequences

- Proposed an algorithm that can find DNA motif using a heuristic approach
- Learned various core heuristic approaches and analyzed how they affect the population

An Algorithmic Approach to Driver Drowsiness Detection in an Autonomous Car
*Technology for an Autonomous World (**IEEE TENSYMP 2020**)*

- Detecting drowsiness from driving behavior (Eye aspect ratio, Gaze, Yawning) and shifting to autonomous
- DOI: 10.1109/TENSYMP50017.2020.9230766

Projects

Facial Expression Recognition | *Deep Learning, Attention Model*
Driver Drowsiness Detection and Alarming System | *Python, Opencv, ML*
Simobot: Simulation for Evolutionary Robotics | *AI, Robotics, Simulation*

Certificates & Awards

- Highest Distinction, Brac University 2021
- Merit Scholarship Award, Brac University 2019-2021
- VC's List and Dean's List Award, Brac University 2019-2022
- Presentation Skill Award, Brac University 2017

Online Course Certificates

Neural Networks and Deep Learning: Issued Oct 2020

- Certification Authority: Coursera, License Number: NVYYFDCBVWDV

Sequence Models: Issued Jun 2020

- Certification Authority: Coursera, License Number: 3SMGJDBNBNDL

Convolutional Neural Networks: Issued Sep 2020

- Certification Authority: Coursera, License Number: PF9VWKNJ9RX5