

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
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Professional Experience

Graduate Research Assistant Aug'2023 – Jun'2025
CIDA Lab, Tennessee State University

- Implementing and enhancing deep learning algorithms for Electronic health record (EHR) 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 character recognition model to address challenges in Bengali OCR (Optical Character Recognition), Detection, and Layout Segmentation
- Engineered and deployed scalable ML systems with docker, including data pipelines, (Flask, Fast) APIs, and continuous deployment workflows, ensuring robust monitoring and optimized approximately 30 % inference time

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
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Technical Skills

Languages and Frameworks: Python, Java, PyTorch, Tensorflow MySQL, Assembly (x86, 8051), Flask, FastAPI

Developer Tools and Libraries: Git, Bash Scripting, Pandas, OpenCV, Scipy, Matplotlib, Seaborn, Docker, AWS, Jupyter, Asana

Software and Design Environments: MATLAB, Simulink, Proteus, LabVIEW, Webots.

Recent Publications

Attention-based Imputation of Missing Values in Electronic Health Records Tabular Data

The 12th IEEE International Conference on Healthcare Informatics(ICH I 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

Projects

Facial Expression Recognition | *Deep Learning, Attention Model*

Driver Drowsiness Detection and Alarming System | *Opencv, Machine Learning*

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