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## Education

### Brac University

Bangladesh

B.Sc in Computer Science and Engineering

2017 – 2021

- CGPA: 3.87/4.0
- 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

### Lecturer (Brac University)

Oct'21 – Present

Conducted classes & assisted students on -

(Linux, Java, Python, Simulator)

- Algorithms(CSE221), Operating Systems (CSE321), Introduction to Robotics (CSE461), System Analysis and Design (CSE471), Digital Logic Design (CSE260)

### Machine Learning Engineer

Jul'21 – Present

Apurba Technologies

- Currently working on Bengali OCR related problems using deep learning based applications
- Conducted research on document layout analysis, OCR model architecture building, bengali word/character detection/segmentation, adversarial attacks

### Undergraduate Teaching Assistant

Jan'20 – May'21

Programming Language I (Structured Programming) & II (OOP)

Java, Python

- Attended Lab Classes and assisted the Faculty Members to conduct the Classes
- Provided Consultation Hours for Problem Solving and Exam Preparation

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## Publications

### A Deep Learning Based Unified Solution for Character Recognition

with OCR Team, Apurba Techlonogy Ltd., Bangladesh (ICPR 2022)

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

### Towards building a Bangla text recognition solution with a Multi-Headed CNN architecture

with OCR Team, Apurba Techlonogy Ltd., Bangladesh (IEEE BigData2021)

- Recognition of Bangla OCR (Handwritten, Typewritten, Computer Composed & Printed) characters
- State-of-the-art performance on both handwritten and printed texts
- DOI: 10.1109/BigData52589.2021.9671653

### A Novel Approach to Enhance Safety on Drowsy Driving in Self-Driving Car

with Prof. Md Motaharul Islam (Springer Nature)

UIU, Bangladesh

- Collected data on drowsy driving and analysed to detect drowsiness and proposed an algorithm to turn on autonomous mode to reach to a safe parking space

### An efficient Metaheuristic Approach for Finding Motifs from DNA Sequences

with Lecturer Faisal Bin Ashraf

Brac University, Bangladesh

- Created an algorithm that can find DNA motif using heuristic approach
- Learned various core heuristic approach and analysed how they affect the population

### An Algorithmic Approach to Driver Drowsiness Detection in an Autonomous Car

with Prof Md Motaharul Islam

UIU, Bangladesh

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

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## Projects

### Facial Expression Recognition | *CNN, State-of-the-art*

- Proposed a state-of-the-art Convolutional Attentional MaskingNetwork and Ensemble Network
- Obtained 76.12% accuracy on detecting FER

### Driver Drowsiness Detection and Alarming System | *Python, Opencv, ML*

- Real-Time driver observation using OpenCV & python API
- State-of-the-art approach to handle post-alarm condition on autonomous vehicle
- The system can book a local parking space and reach there if the driver is sleepy

### Simobot: Simulation for Evolutionary Robotics | *AI, Robotics, Simulation*

- a reddit-based Massively Open Online Course (MOOC) for creating and training simulated robots by Professor Josh Bongard
- Learned how to build and evolve simulated robots to perform a variety of tasks using AI learning algorithms

### Introduction to Robotics course project: object detection and line follower robot | *AI, Robotics, Webot*

- Built a robot by using the idea learned from theory class and used different sensors, actuators to make the object detection robot and further extended it to make a line follower robot

### Hybrid Key Generation for Blockchain Wallet | *Blockchain, Python*

- Created hybrid key using RSA & ECDSA to make a transaction from wallet

### Virtual Library Management System | *HTML, CSS, PHP, MySQL*

- Designed System Analysis
- Made user and admin panels with HTML and CSS.
- Connected to Database which is made with PHP and MySQL

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## Extracurriculars

### **Brac University Computer Club**

*Creative Department*

Jan 2019 - Dec 2019

*Executive*

- Made posters for social media and Contributed to different clubbing events
- Assigned tasks to juniors depending on their knowledge capability

### **IEEE BRAC University Student Branch**

*Apprenticeship*

Sep 2018 – Sep 2019

*Student Member*

- Attended conference on multiple webiner

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## Certificates & Awards

### Merit Scholarship Award, Brac University

Sept 2018 - May 2021

- 10% waiver on Tuition Fees on every semester.

### VC's List and Dean's List Award, Brac University

- Got placed on VC's List for 5 semesters as recognition of achieving a GPA of 3.90-4.00 on those particular semesters.
- Got placed on Dean's List for 3 semesters as recognition of achieving a GPA of 3.70-3.89 on those particular semesters.

### Presentation Skill, Brac University

Sept 2017 - Nov 2017

- As an activity at Residential Campus, Brac University
- Learned how to solve case studies on current affairs and presented them to the panel members

### 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

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### Technical Skills

**Languages:** Java, Python, C/C++ (basic), MySQL, JavaScript(basic), HTML/CSS, Assembly (x86, 8051)

**Hardware Description and Modeling Languages (HDLs):** Verilog, VHDL

**Developer Tools/Frameworks:** Jupyter Notebooks, Git, Keras, Tensorboard, Pytorch, Tensorflow, Docker, Google Cloud Platform, VS Code

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

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### References

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