

# Prachurja Bhattacharjee

Computer Science and Engineering Undergraduate  
BRAC University

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## Education

Bachelor of Science in Computer Science and Engineering  
BRAC University  
CGPA: 3.87 / 4.00

Jan 2022 – Present

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## Technical Skills

- Programming Languages: Python, Java, C (Basic), Assembly, OOP
  - Machine Learning & AI: Scikit-learn, TensorFlow, Keras, PyTorch
  - Data Science: Pandas, NumPy, Matplotlib
  - NLP: Text Classification, Speech-to-Text, Transformers
  - Web Technologies: Django, MERN Stack (MongoDB, Express, React, Node)
  - Databases: MySQL, MongoDB
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## Projects

### Real-Time Closed Captioning for Bengali Multimedia

- Developed a low-latency Bengali speech-to-text system using fine-tuned Whisper and Wav2Vec 2.0 (XLS-R).
- Implemented VAD-based chunking (Silero VAD), dynamic stride segmentation, and noise suppression.
- Applied overlapping-text removal and two-context inference to improve transcription accuracy.
- Evaluated system performance using WER and CER metrics for real-time broadcast environments.

### Disaster Tweet Classification (NLP)

- Implemented text classification using RNN, Bi-LSTM, Bi-GRU, and ALBERT models.
- Analyzed and classified disaster-related tweets to support real-time crisis response.

### Brain Tumor MRI Segmentation & Classification (Deep Learning)

- Implemented U-Net, Attention U-Net, and Multi-Task Joint Model in PyTorch achieving **99.10% classification accuracy** across 4 tumor types on BRISC 2025 dataset (3,933 training images).
- Attained **0.8731 Dice coefficient** and 0.7843 IoU for tumor segmentation with 99.29% pixel-level accuracy using CUDA-accelerated training.
- Demonstrated **62% faster training** and 9.4% parameter reduction through joint training approach compared to separate model architectures.
- Developed interactive demo for real-time tumor detection and classification from MRI scans with visualization capabilities.

## **JOBlent – Web-Based Job Portal (MERN Stack)**

- Contributed to a full-stack job portal enabling job posting, applications, and user profile management.
- Worked on React frontend (UI components, routing, notifications) and backend (REST APIs, MongoDB).
- Collaborated using Git and followed version control best practices.

## **Encryption–Decryption System (Assembly Language)**

- Developed a secure text encryption-decryption system with password protection.
- Supported uppercase, lowercase, numeric, and special character encryption with reverse operations.

## **Treasure Hunt – 2D Maze Game (OpenGL)**

- Developed a 2D game using OpenGL with dynamic rendering and interactive gameplay.
- Demonstrated skills in computer graphics, game logic, and problem-solving.

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## **Experience**

**Student Tutor – Object-Oriented Programming**  
BRAC University

Nov 2024 – May 2025

- Assisted undergraduate students in understanding OOP concepts and programming practices.
- Supported lab sessions and clarified course-related technical problems.

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## **Co-curricular & Volunteering**

**BRAC “Srijon” Student Outreach Program – Instructor & Volunteer**

- Received intensive training and taught ICT and Social Science to school students.
- Delivered structured lessons and contributed to BRAC’s community education initiative.

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## **Languages**

Bengali (Native), English (Professional Working Proficiency)