## **Project Proposal**

### **Brain Tumor Segmentation Using Deep Learning**

### **North East University Bangladesh**

**Dept of Computer Science and Engineering**  **Course Title:** Deep Learning Lab  
 **Course Code:** CSE-460

### **Submitted By**

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### **📘 1. Project Overview**

This project focuses on developing a deep learning model to automatically segment brain tumors from MRI images.  
 It follows a structured approach involving data preprocessing, model building, training, evaluation, and deployment.  
 The main goal is to assist radiologists by identifying tumor areas accurately and efficiently.

### **🎯 2. Objective**

The objective of this project is to build a brain tumor segmentation system using deep learning.  
 This system will take MRI images as input and produce tumor-segmented output, helping in early detection and diagnosis.  
 The project also aims to deploy the model in a web app interface using tools like **Streamlit** or **Flask** for user interaction.

### **⚙️ 3. Methodology**

#### **1. Data Collection & Preprocessing**

* Dataset: BRATS (includes T1, T2, FLAIR MRI images)
* Preprocessing steps: Normalization, Resizing, Data Augmentation
* Data split into: Training, Validation, Testing sets

#### **2. Model Development**

* Model: U-Net or CNN with Attention Mechanism
* Architecture: Encoder-decoder with skip connections
* Platform: TensorFlow/Keras

#### **3. Model Training & Evaluation**

* Loss Function: Dice Loss or Binary Crossentropy
* Optimizer: Adam
* Evaluation Metrics: Dice Score, Accuracy, IoU

#### **4. Deployment**

* Deployment Tool: Streamlit or Flask
* Input: MRI Image
* Output: Segmented Tumor Area

### **✅ 4. Expected Outcomes**

* Learn end-to-end deep learning workflow for medical image segmentation
* Gain experience with model training, evaluation, and tuning
* Successfully deploy a usable segmentation model for real-time use

### **📌 5. Conclusion**

This project aims to build a robust brain tumor segmentation system using deep learning.  
 It combines preprocessing, model training, and real-time deployment, providing a practical solution for automated tumor detection.  
 By completing this project, we will gain valuable experience in medical AI, image processing, and deployment of AI applications.