

**Early Detection of Brain Tumors**

## **Project Proposal**

***Submitted by***

## **Teppala Niraj (22BAI71402)**

**K Sai Vardhan (22BAI70556)**

**Pasam Tharun (22BAI70607)**

**Narra Snehith (22BAI70651)**

***In partial fulfilment for the award of the degree of***

# Bachelors of Engineering

**IN**

Computer Science with specialization in Artificial Intelligence and Machine Learning



**Chandigarh University**

January-May 2024

DEPARTMENT OF APEX INSTITUTE OF TECHNOLOGY

**PROJECT PROPOSAL**

# Project Title: -

**Early Detection Of Brain Tumors**

# Project Scope:

* 1. Introduction:

Brain tumors are a serious health risk to people since they frequently result in serious neurological

problems and, very frequently, fatal consequences. Prompt identification is essential to bettering

patient outcomes since therapy effectiveness and prognosis may both be improved with early

intervention. Modern imaging techniques like MRIs and CT scans are used to diagnose brain tumors.

These methods are useful, but they may not be available everywhere, and their sensitivity varies

depending on the location and size of the tumor.

* 1. Project Goals:

The following are the project's primary goals:   
 • User Interface: Creating a user-friendly interface for efficient data input.

• Imaging and Analysis: Utilizing advanced techniques for improved early detection.  
 • Detection Algorithm: Creating a robust algorithm for early tumor identification.  
 • Diagnostic Reporting: Generate clear, concise reports summarizing key findings.  
 • User Feedback and Testing: Integrating continuous user testing for app usability and

effectiveness.  
 • Efficiency Assessment: Conducting rigorous testing to evaluate the detection algorithm's

accuracy.

Methodology

The project will involve the following crucial phases:   
 • Involves data acquisition, preprocessing, machine learning, advanced techniques, validation, and

deployment.

• Uses imaging modalities, biomarkers, radiomics, multimodal analysis, and clinical knowledge

integration.

• Future directions include early-stage tumor detection, personalized medicine, and n• Continuous

improvement aims to improve patient outcomes and survival rates.

on-invasive methods.  
 • Ethical considerations include data privacy, security, and equitable access.

* 1. Expected outcomes

• Improves detection sensitivity, accuracy, and intervention opportunities.   
 • Enhances diagnostic speed and user-friendliness.  
 • Reduces healthcare costs and increases patient survival rates.  
 • Enhances collaboration with healthcare professionals.  
 • Adapts to diverse patient profiles.  
 • Ensures ethical and regulatory compliance.

D. Importance of the Initiative

• Importance: Improves patient outcomes, reduces healthcare burden, enhances treatment planning,

increases survival rates, promotes preventive healthcare, advances medical science, and reduces

neurological complications.  
 • Aligns with ethical considerations, patient empowerment, and global neurological health

challenges.  
 • Contributes to better public health and efficient healthcare system.

# Requirements: -

* Hardware Requirements:
  + High-quality MRI (Magnetic Resonance Imaging) and CT (Computed Tomography) scanners with advanced imaging capabilities.
  + PACS (Picture Archiving and Communication System) for efficient storage and retrieval of medical images.
* Software Requirements:
  + DICOM (Digital Imaging and Communications in Medicine) software for processing and handling medical imaging data.Python for backend development and NLP tasks.
  + TensorFlow or PyTorch for developing and implementing machine learning models.
  + Advanced image preprocessing tools for cleaning and enhancing imaging data.

**STUDENTS DETAILS**

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| **Name** | **UID** | **Signature** |
| Teppala Niraj | 22BAI71402 |  |
| K Sai Vardhan | 22BAI70556 |  |
| Pasam Tharun | 22BAI70607 |  |
| Narra Snehith | 22BAI70651 |  |

**APPROVAL AND AUTHORITY TO PROCEED**

We approve the project as described above, and authorize the team to proceed.

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| --- | --- | --- |
| **Name** | **Title** | **Signature (With Date)** |
| Mr.Jaswinder Singh |  |  |