Project Proposal

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Brain Tumor Detection

What is Brain Tumor?

A brain tumor is characterized by the growth of abnormal cells within the brain. The brain's complex anatomy encompasses various regions, each responsible for distinct nervous system functions. Brain tumors can emerge in any part of the brain or skull, including the protective lining, the skull base, the brainstem, the sinuses, the nasal cavity, and numerous other areas.

How does it impact human lives?

- A brain tumor is considered one of the most aggressive diseases, affecting both children and adults. Brain tumors account for 85 to 90 percent of all primary Central Nervous System (CNS) tumors.
- Each year, approximately 11,700 people are diagnosed with a brain tumor.
- The 5-year survival rate for individuals with a cancerous brain or CNS tumor is about 34 percent for men and 36 percent for women.
- Brain tumors are classified into several types, including benign tumors, malignant tumors, and pituitary tumors.
- Proper treatment, planning, and accurate diagnostics are essential to improving patients' life expectancy.
- The best technique for detecting brain tumors is Magnetic Resonance Imaging (MRI), which generates a large amount of image data. These images are examined by radiologists, but manual examination can be error-prone due to the complexities involved in brain tumors and their characteristics.

1) Problem Statement:

The detection and classification of brain tumors, which account for a significant portion of primary Central Nervous System (CNS) tumors, present a critical challenge due to their complexity and the substantial volume of MRI image data generated. Current manual examination methods are prone to errors, underscoring the need for advanced diagnostic tools to enhance accuracy and improve patient outcomes. The goal of this project is to analyze MRI images of the brain to accurately determine the presence of tumors and minimize human error in diagnosis.

2) Stakeholders:

The client for a brain tumor detection problem could be medical researchers, hospitals and clinics, regulatory bodies, healthcare technology companies and healthcare providers.

3) Dataset:

The dataset is obtained from Kaggle called Brain Tumor Detection. The dataset contains 3 folders: yes, no and pred which contains 3060 Brain MRI Images.

Folder	Description
yes	The folder yes contains 1500 Brain MRI Images that are tumorous
no	The folder no contains 1500 Brain MRI Images that are non-tumorous