

Brain Tumour Detection Using Deep Learning(Django)

Abstract

Brain tumors represent a complex medical challenge requiring accurate diagnosis for effective treatment and improved patient outcomes. This study proposes an integrated approach to brain tumor detection leveraging advanced machine learning techniques within a web-based platform developed using Django. The dataset encompasses a diverse array of medical imaging data, including MRI scans, covering both benign and malignant tumors, facilitating robust model training and validation.

The methodology adopted involves meticulous preprocessing of the dataset to standardize image resolutions and ensure data consistency. Subsequent application of data augmentation techniques enhances model generalization and robustness. The machine learning model employed for brain tumor detection is tailored for medical image analysis, utilizing deep learning architectures such as Convolutional Neural Networks (CNNs) or Recurrent Neural Networks (RNNs).

The trained model is seamlessly integrated into a web-based platform powered by Django, allowing users to upload MRI scans and receive real-time diagnostic predictions. The platform offers features such as seamless image uploads, instantaneous prediction results, and visualization of diagnostic outcomes. Performance evaluation metrics, including accuracy, sensitivity, specificity, and area under the receiver operating characteristic curve (AUC-ROC), validate the model's efficacy in accurately detecting and classifying brain tumors, distinguishing between benign and malignant cases with high precision.

This research contributes to the field of medical imaging and healthcare technology by providing a practical solution for early detection and diagnosis of brain tumors. By leveraging advanced machine learning techniques and a user-friendly web interface, this approach aims to enhance diagnostic accuracy and accessibility, ultimately leading to improved patient outcomes and prognosis for individuals affected by brain tumors.

In conclusion, the integration of advanced machine learning models within web-based platforms represents a significant advancement in utilizing technology for medical diagnosis and treatment. This system holds promise for facilitating early detection and intervention for brain tumors, thereby contributing to efforts to combat this complex disease and improve patient care in neurology and oncology practice.