**Abstract—**

Largely, brain-based illnesses are prevalent in society. The main reason brain diseases occur is because of cell growth. It therefore impacts the brain's regular operation, which in turn impacts the health of other essential organs' functionality. Aggressive brain cancer is ultimately the outcome of cell growth. Early detection of tumors in the brain is one of the primary strategies to lower the number of fatalities from brain tumors. With the help of image processing technique, the images from various sources such as computed tomography (CT) scan, MRI scan, etc. are collected and used for brain tumor detection. The noises in the images are eliminated in the preprocessing stage of the research. The model is developed using deep learning methods including support vector machines (SVM) and convolutional neural networks (CNN). The objective of this research is to create a model that can identify brain tumors from CT scan pictures. We took into account many parameters, including accuracy, recall, loss, and area under the curve , in order to assess the efficacy of the models.

**Existing System**

The existing systems for brain tumor detection often suffer from significant limitations that hinder their effectiveness and usability. Many rely heavily on manual input from healthcare professionals, which not only increases the chances of human error but also leads to longer diagnosis times. Additionally, existing systems may lack integration with modern technologies, resulting in inefficient data handling and processing. Users are frequently faced with complex interfaces that can be overwhelming, particularly for those without a technical background. Furthermore, the absence of a robust user authentication and activation process can leave sensitive patient data vulnerable to unauthorized access. Overall, these shortcomings can lead to delays in treatment, decreased diagnostic accuracy, and ultimately, a less satisfactory experience for both patients and healthcare providers.

**Algorithms :**

1. K-Nearest Neighbors (KNN)
2. Support Vector Machines (SVM)
3. Decision Trees
4. Random Forests

**Disadvantages:**

1. **Manual Input Errors**: The reliance on healthcare professionals for data entry increases the likelihood of human errors, which can compromise the accuracy of diagnoses.
2. **Inefficient Workflow**: Existing systems often lack automation, resulting in lengthy diagnosis times and delayed treatment for patients.
3. **Complex User Interfaces**: Many current systems are not user-friendly, making it challenging for healthcare providers to navigate and utilize effectively, particularly for those with limited technical skills.
4. **Lack of Integration**: The inability to integrate with modern technologies and other healthcare systems leads to inefficiencies in data management and processing.
5. **Inadequate Security Measures**: Weak user authentication processes can leave sensitive patient data exposed to unauthorized access and breaches, compromising patient confidentiality.
6. **Limited Scalability**: Existing systems may not be designed to scale efficiently with increasing data volumes, leading to performance issues and potential system failures.

**Proposed System**

The proposed MRI brain tumor detection system offers a revolutionary approach to diagnosing brain tumors, leveraging cutting-edge machine learning algorithms and user-friendly design. With an emphasis on automation, the system significantly reduces the reliance on manual input, thereby minimizing human errors and expediting the diagnostic process. The integration of advanced image processing techniques ensures accurate detection of tumors, allowing for timely intervention and improved patient outcomes. The user interface is designed to be intuitive and accessible, catering to users of varying technical expertise, which enhances overall user satisfaction. Additionally, the implementation of a secure user authentication and activation system protects sensitive patient information, ensuring privacy and data integrity. This proposed system not only improves diagnostic efficiency but also empowers healthcare providers with reliable tools for early detection, ultimately contributing to better health management and outcomes for patients.

**Advantages of the Proposed System**

1. **Automated Processes**: The proposed system significantly reduces the need for manual input by utilizing automated algorithms, which minimizes errors and speeds up the diagnostic process.
2. **Enhanced Accuracy**: Advanced machine learning techniques improve the precision of tumor detection, allowing for earlier and more accurate diagnoses, which can lead to better patient outcomes.
3. **User-Friendly Interface**: The intuitive design of the system makes it accessible for users with varying technical backgrounds, ensuring a smoother user experience and quicker adoption.
4. **Integration Capabilities**: The proposed system can integrate with other healthcare technologies and databases, improving data handling and streamlining workflows.
5. **Robust Security Measures**: Implementing strong user authentication and data encryption protocols ensures the protection of sensitive patient information, enhancing overall trust in the system.
6. **Scalability**: The system is designed to handle increasing amounts of data efficiently, allowing for future expansion without compromising performance.