DAYANANDA SAGAR COLLEGE OF ENGINEERING

Department Of Computer Science & Engineering

BRAIN TUMOR PREDICTION USING DEEP LEARNING NETWORK

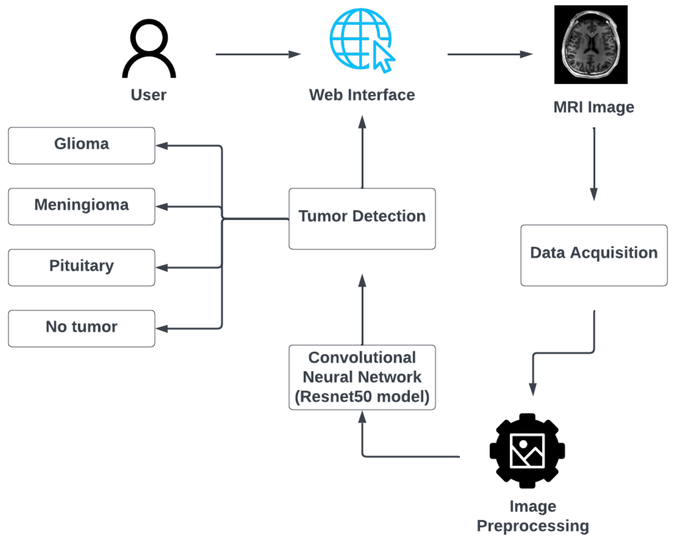
BATCH No. - 17
Yukta N Shettigar (1DS19CS197), Bhargavi S (1DS19CS198), Keerthana K (1DS19CS721), K R Divyashree (1DS19CS722)

GUIDED BY:
Prof. S Keerthi, Assistant Prof.

ABSTRACT

The proposed system integrates **ResNet50** deep learning network with a web application for automated brain tumor prediction. By leveraging MRI scans, it achieves an impressive accuracy of around 98% in detecting and classifying tumors into **Glioma**, **Meningioma**, **Pituitary**, and **No Tumor** categories. The system utilizes pre-processed images, Flask framework for a user-friendly interface, and evaluates performance using metrics like Accuracy, Precision, and Sensitivity. The results demonstrate the effectiveness of this approach in accurately predicting the presence of brain tumors and classifying their types.

ARCHITECTURE



IMPLEMENTATION

1. **Data Collection and Preparation:** Diverse brain tumor MR images are collected and labeled.
2. **Data Pre-Processing:** Images are scaled, normalized, and augmented if needed. Data cleaning ensures quality. Dataset is split into subsets.
3. **Model Selection:** ResNet50, a pre-trained deep CNN, is chosen for its performance.
4. **Model Customization:** ResNet50 is fine-tuned by replacing the classification layer.
5. **Training:** ResNet50 is trained using labeled data with categorical cross-entropy loss and Adam optimization.
6. **Model Evaluation:** Performance metrics are computed using a validation set.
7. **Classification:** Tumors are classified into four categories.
8. Testing: Model's performance is assessed on an independent testing set.
9. **Web Integration:** Model is incorporated into a user-friendly web application.

CONCLUSION

In conclusion, this study successfully developed a Brain Tumor Prediction system using the **ResNet50**, Deep Learning Model. The model achieved impressive performance with an **Accuracy** of **98.78%**, **Precision** of **99.0%**, **F1 Score** of **99.0%**, and **AUC** value of **1.0**. The utilization of deep learning techniques and ResNet50 architecture enabled accurate classification of brain tumor images into different categories. However, further validation on larger datasets and addressing the interpretability of the model's decision-making process are important areas for future improvement.

RESULT