Design And Development Of Brain Tumor Disease Prediction And Classification Using Deep Learning Algorithm Deep CNN and BiLSTM

Presented By :

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Branch:

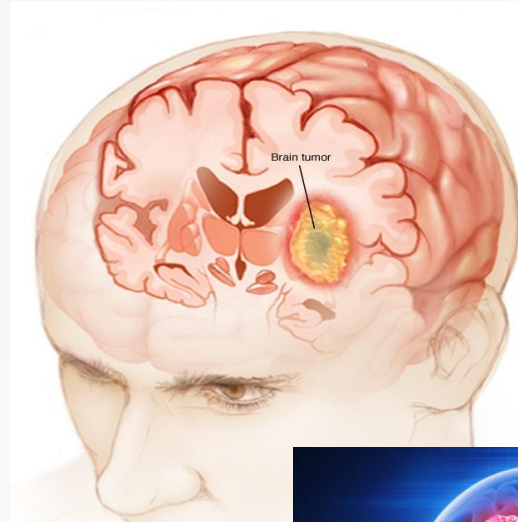**C.S.E. (AIML)**

Semester-VIII

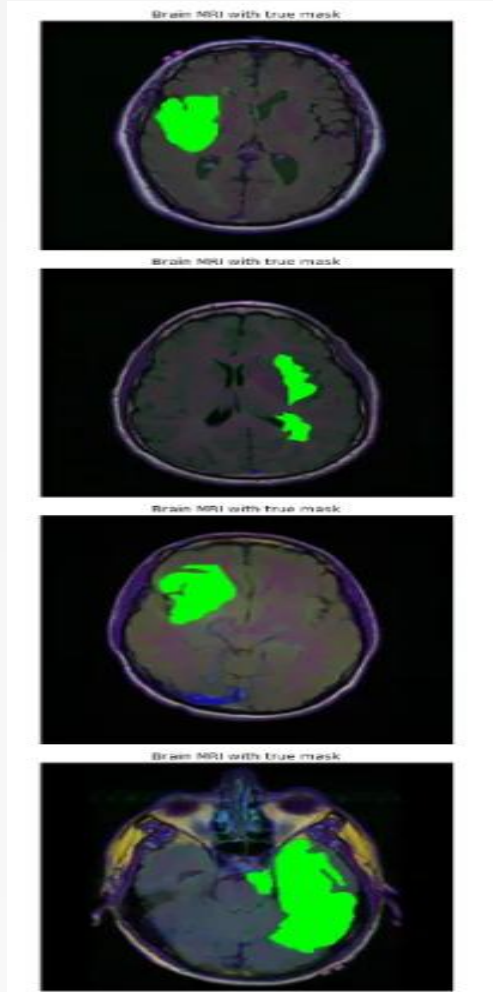**Guided By:**

Prof. Vivek Pandey Sir

Outline To Talk

- **Introduction**
- **Research Objectives**
- **Literature Review**
- **Working Principle**
- **Results**
- **Conclusion**
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Introduction

A tumor is nothing but excess cells growing in an uncontrolled manner.

To detect tumor blocks and classify the type of tumor using Deep Convolution Neural Network Algorithm and Bidirectional Long-Short Term Memory for MRI images of different patients.

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Research Objectives

- **Collect a comprehensive dataset of brain tumor images, including different types and stages of tumors.**

- **Preprocess the data and Investigate effective feature extraction techniques for brain tumor images using deep CNNs to capture relevant patterns and structures.**

- **Explore the use of BiLSTM to model sequential dependencies in the data, especially in cases where temporal information is essential.**

- **Design and implement a hybrid deep learning model that combines the strengths of BiLSTM and deep CNN for accurate prediction and classification to optimize the model's performance.**

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Literature Review

- **A general overview of the literature on brain tumor disease prediction and classification using deep learning algorithms like BiLSTM and deep CNN.**

- **Here are some key studies and trends in this field:**

- **Sharma and Shukla (2021): Thresholding, conventional supervised and unsupervised based segmentation techniques are briefly described.**

- **Tiwari (2020): A detailed hierarchical classification of brain tumor presented. A brain tumor segmentation technique, including: those based on thresholding, conventional supervised and unsupervised and deep learning.**
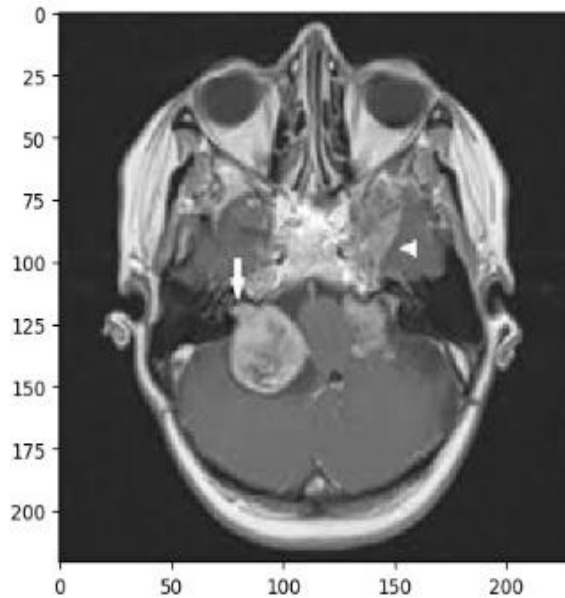
Working Principle
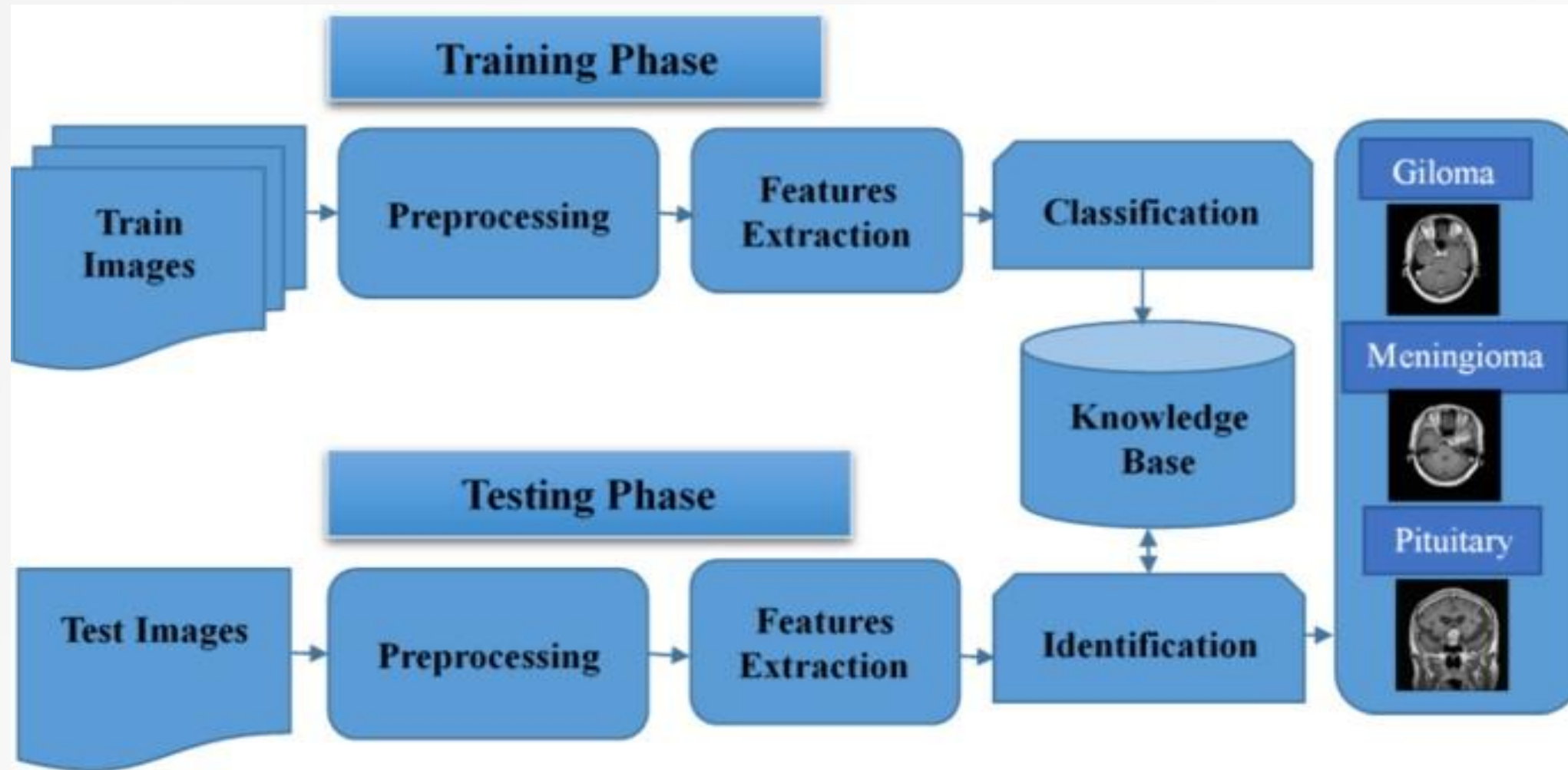
Results

```
from tensorflow.keras.preprocessing import image
img = image.load_img('/kaggle/input/brain-tumor-mri-dataset/Testing/meningioma/Te-meTr_0002.jpg')
plt.imshow(img, interpolation='nearest')
plt.show()
```


NO.	Types Of Brain Tumor
0	Glioma
1	Meningioma
2	No Tumor
3	Pituitary

```
a=model.predict(img_array)
indices = a.argmax()
indices
```

```
1/1 [==============================] - 1s 966ms/step
1
```

Conclusion

	precision	recall	f1-score	support
glioma	0.98	0.81	0.89	348
meningioma	0.81	0.91	0.86	329
notumor	0.95	0.97	0.96	411
pituitary	0.96	0.99	0.98	317
accuracy			0.92	1405
macro avg	0.93	0.92	0.92	1405
weighted avg	0.93	0.92	0.92	1405
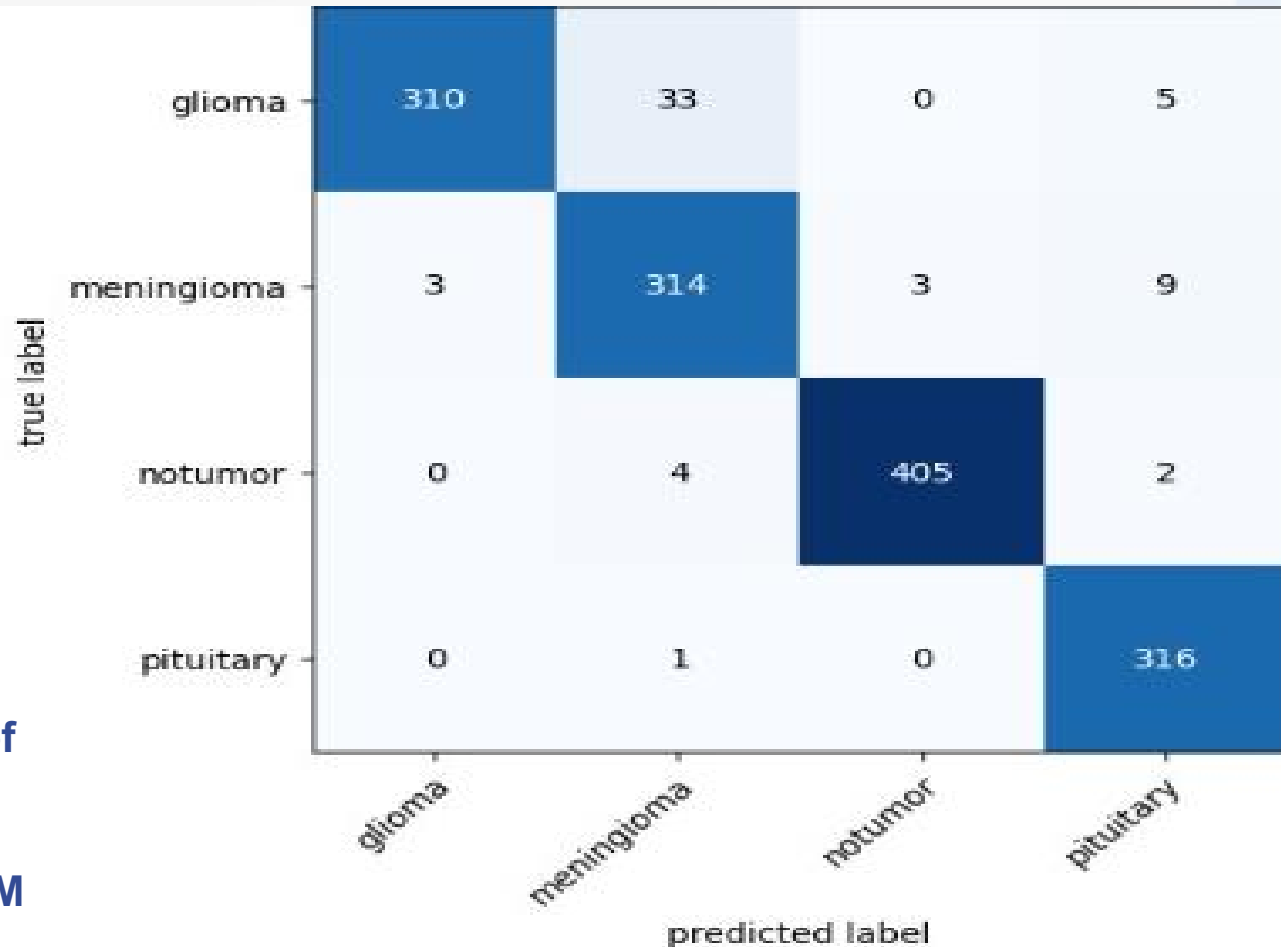
This works shows that the overall accuracy of deep learning models.

It can be mitigated with the DCNN and BiLSTM

It has achieved F-1 score accuracy of up to 92%.

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Future Scope

- **Integration with telemedicine platforms could extend the reach of expert diagnostics to remote or underserved areas.**

- **Future research may involve closer partnerships with radiologists, oncologists, and other experts to ensure the clinical relevance and practicality of developed models.**

- **As AI technologies continue to advance, there will be a need for robust ethical frameworks and adherence to regulatory standards in the development and deployment of brain tumor prediction systems to ensure patient privacy and safety.**

References

- •[1] L.Guo,L.Zhao,Y.Wu,Y.Li,G.Xu,andQ.Yan,"Tumor detection in MR images using one-class immune feature weighted SVMs," IEEE Transactions on Magnetics, vol. 47, no. 10, pp. 3849–3852,2018.

- [2] J. C. Buckner, P. D. Brown, B. P. O'Neill, F. B. Meyer , C. J. Wetmore,J. H Uhm, "Central nervous system tumors." In Mayo Clinic Proceedings, Vol. 82, No. 10, pp. 1271- 1286, October 2020.

- [3] Deepa , Singh Akansha. (2018). - Review of Brain Tumor Detection from tomography. International Conference on Computing for Sustainable Global Development (INDIACom)

- [4] Preston, D. c. (2019). Magnetic Resonance Imaging (MRI) of the Brain and Spine from Basics. casemed.case.edu