

Single Day Event

**Brain Tumor Segmentation and Classification
Using Advanced Machine Learning Techniques**

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ICON plc**

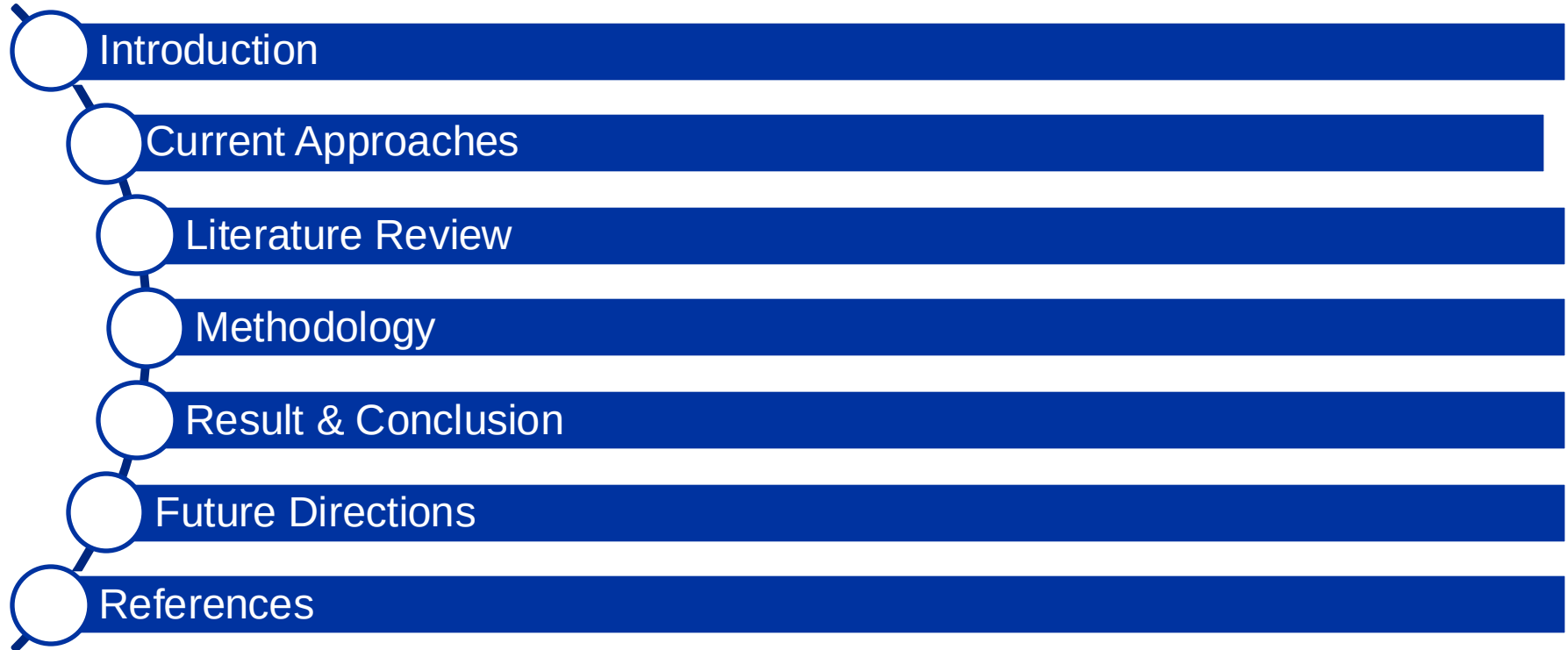


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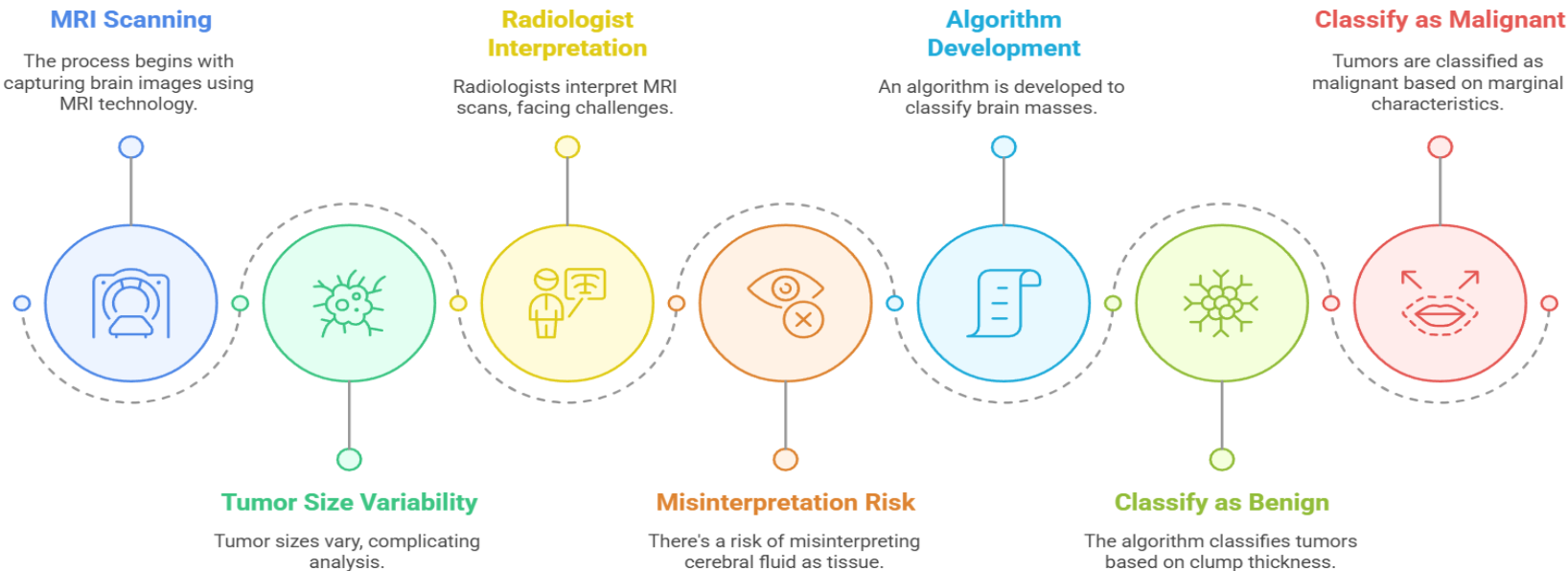
Agenda



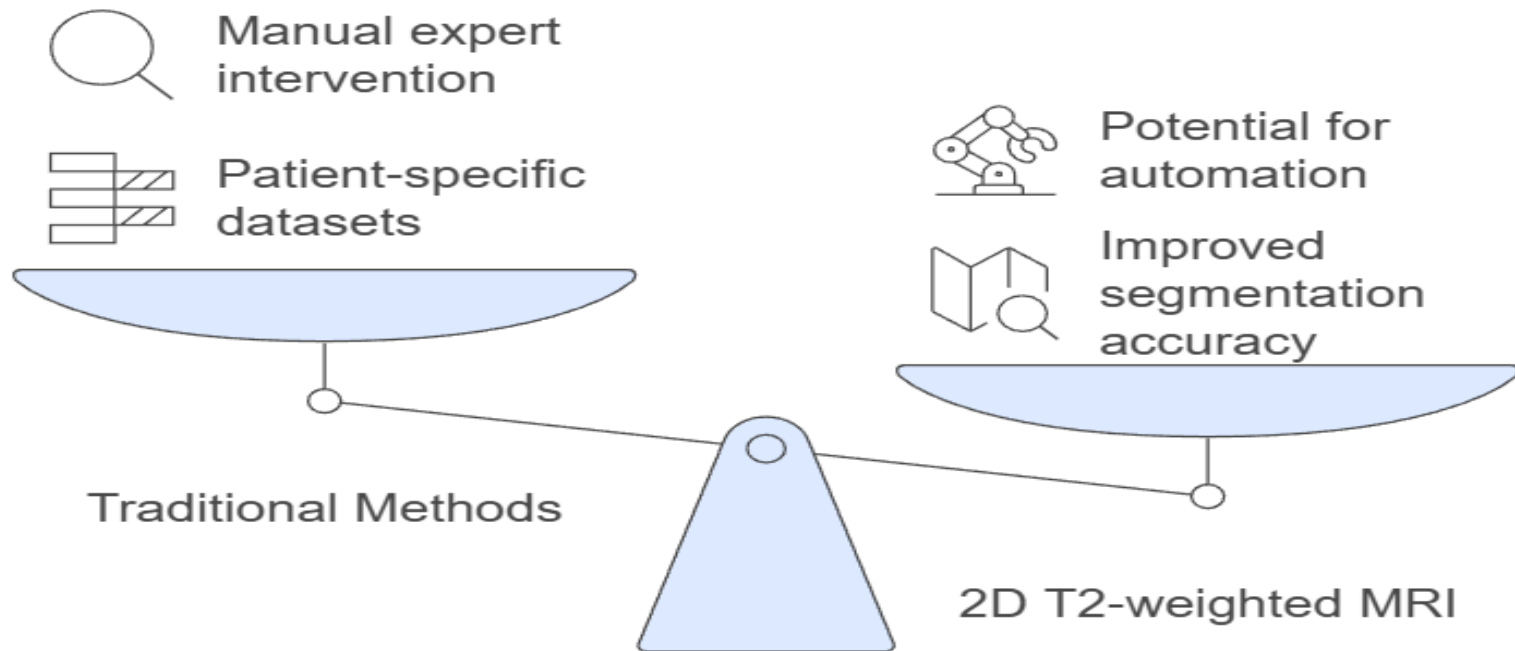


Introduction

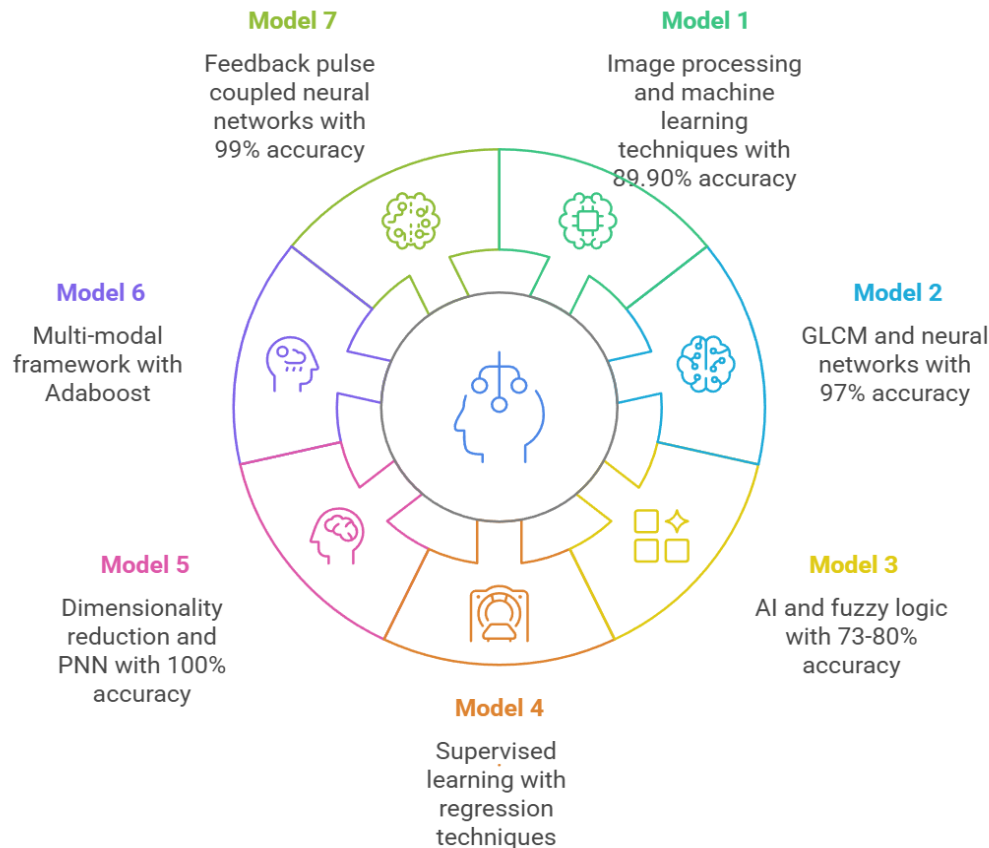
MRI-Based Brain Tumor Analysis Process



Current Approaches



Divergent Approaches in Tumor Detection

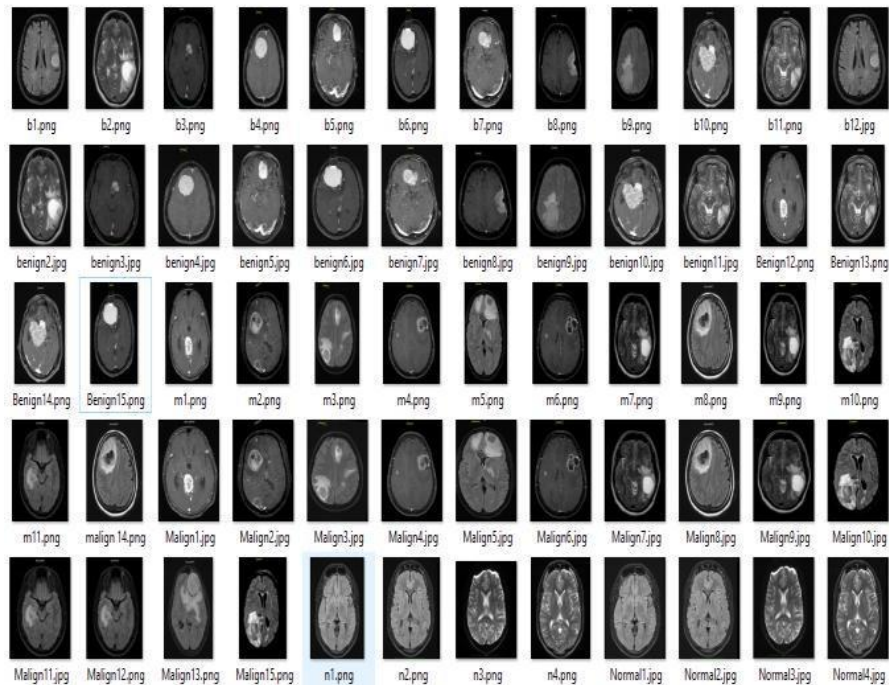


* U. Baid, S. Talbar et al, Comparative Study of K-means, Gaussian Mixture Model, Fuzzy C-means algorithms for Brain Tumor Segmentation", ICCASP/ICMMD-2016. Advances in Intelligent Systems Research. Vol. 137, Pp. 592-597.

* Zhe Xiao, Ruohan Huang, Yi Ding, Tian Lan,, "A Deep Learning-Based Segmentation Method for Brain Tumor in MR Images", IEEE 2017

Methodology - Input Brain MRI Image

MRI Image Acquisition Process

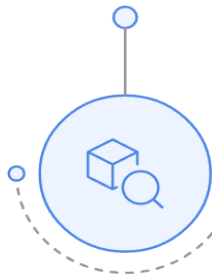


MRI Image Pre-processing

MRI Image Pre-Processing Sequence

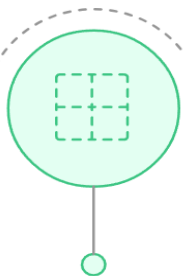
Identify Need for Pre-Processing

Recognizing the necessity for image clarity



Apply Adaptive Median Filter

Filtering out noise while preserving details



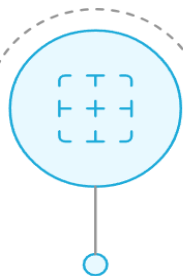
Differentiate Pixel Types

Classifying pixels into noisy and noise-free



Apply Filters Based on Pixel Type

Using appropriate filter size for noise



Preserve Noise-Free Pixels

Ensuring clarity by retaining original pixels



Compare Filter Results

Evaluating the effectiveness of filtering methods

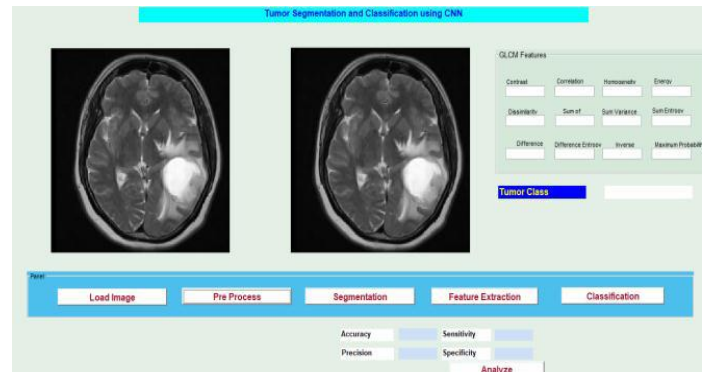
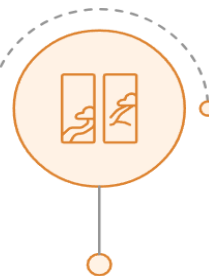


Image Segmentation

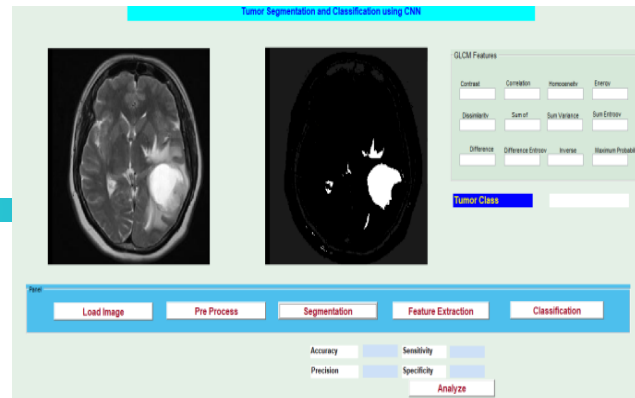
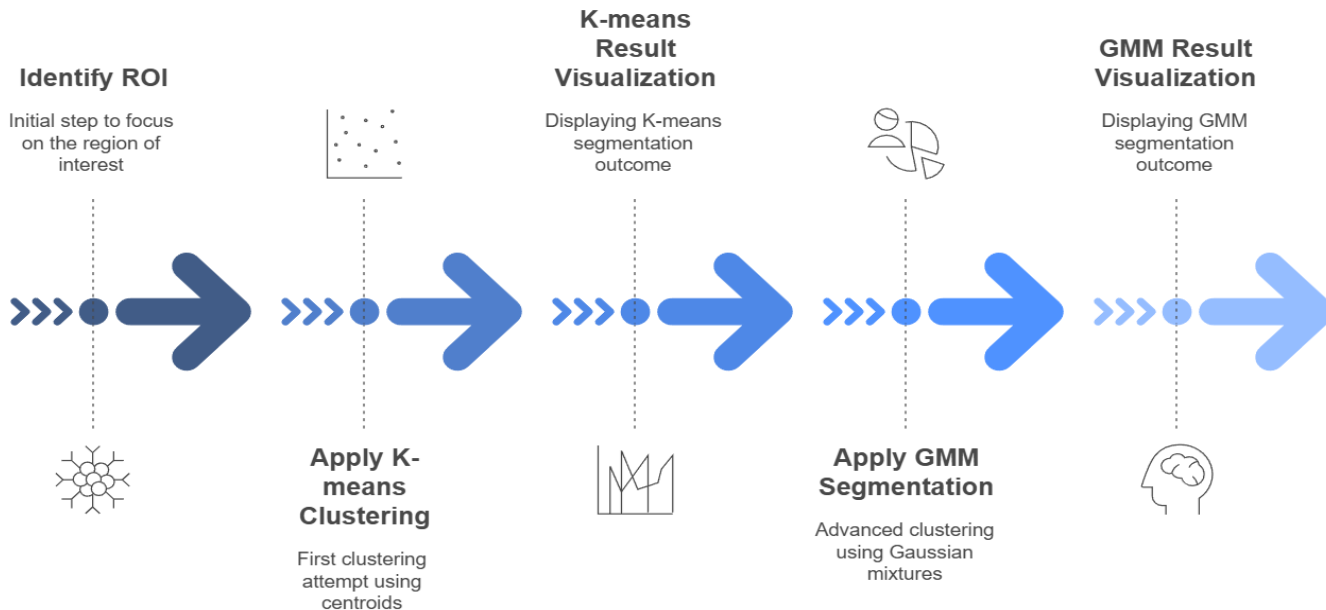


Image Segmentation Process



Feature Extraction

Feature Extraction in Tumor Analysis

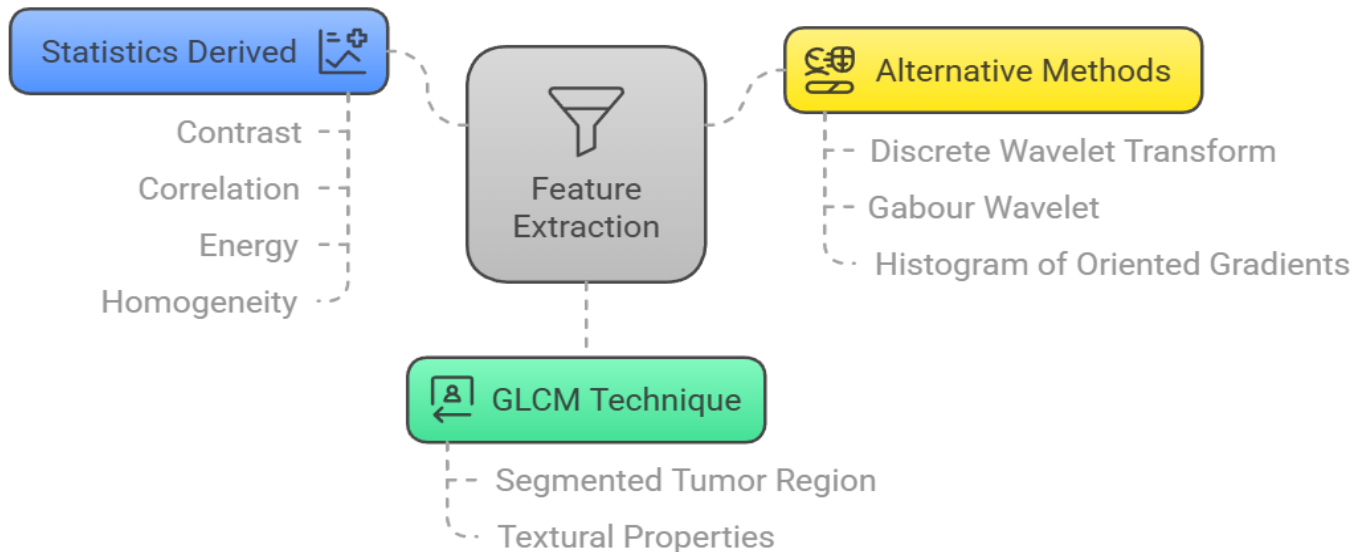
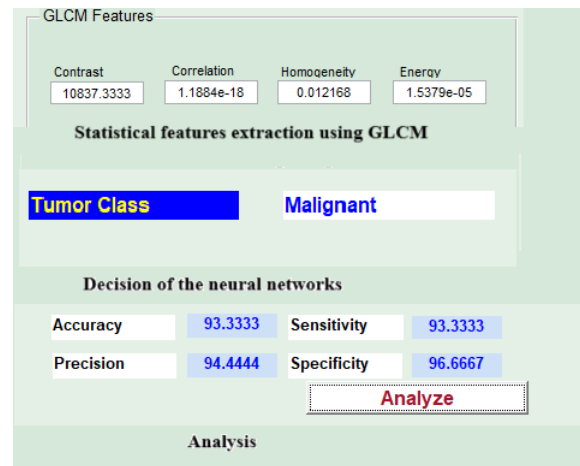
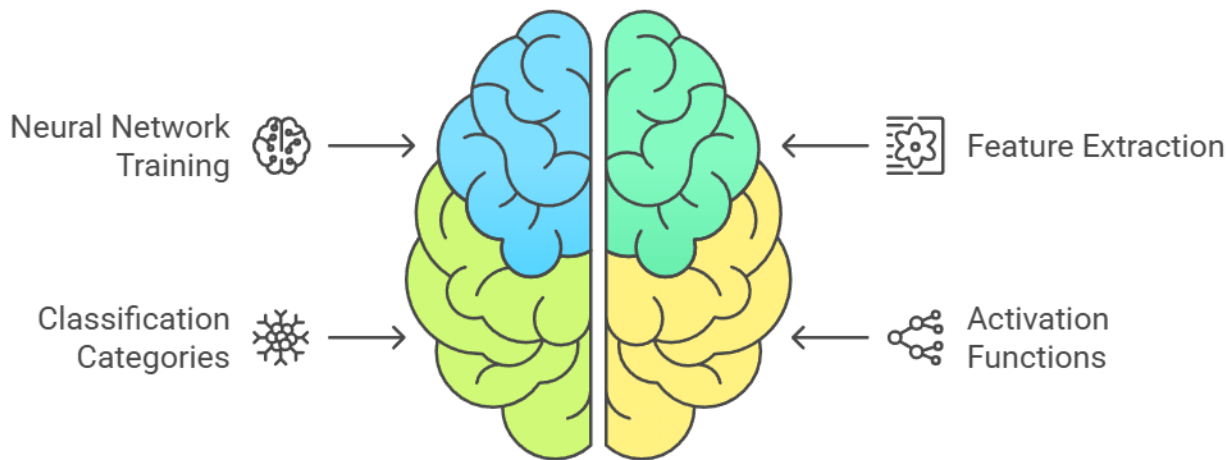


Image Classification

- Classification through Neural Networks (NN) for accurate categorization.

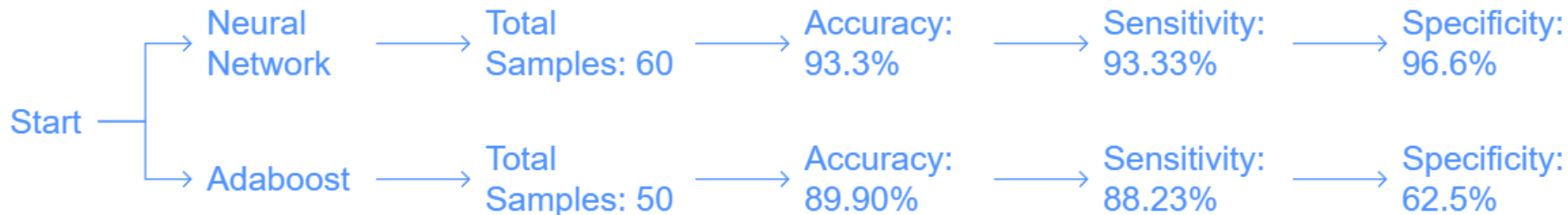
MRI Image Classification Breakdown





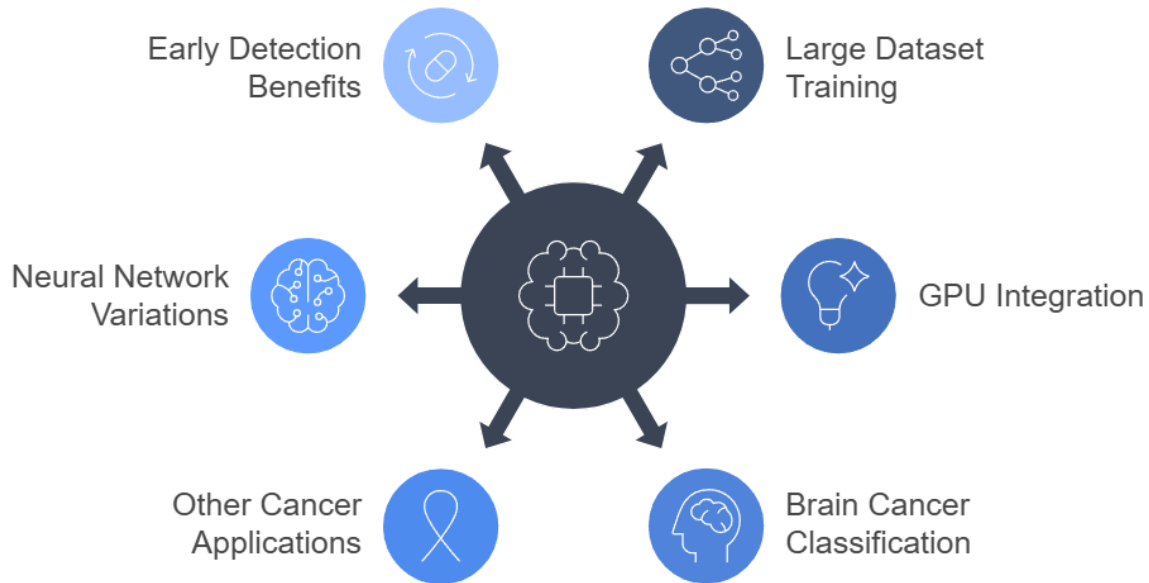
Result and Conclusion

Comparison of Machine Learning Algorithms



Future Directions

Future Scope of Cancer Diagnosis Project



References

- Astina Minz, “MR Image classification using adaboost for brain tumor type”, IEEE International Advance Computing Conference (IACC) <https://ieeexplore.ieee.org/document/7976880>
- Brain Tumor Detection: An Application Based on Machine Learning <https://ieeexplore.ieee.org/document/9456347>
- Brain Tumor Identification and Classification of MRI images using deep learning techniques.
<https://ieeexplore.ieee.org/document/9166580>
- Brain Cancer Classification Using GLCM Based Feature Extraction in Artificial Neural Network.
<https://www.ijcset.com/docs/IJCSET13-04-07-077.pdf>
- Convolution neural network for automatic facial expression recognition. <https://ieeexplore.ieee.org/document/7988558>
- Daljit Singh, Kamaljeet Kaur, “Classification of Abnormalities in Brain MRI Images using GLCM, PCA and SVM
- Haidi Ibrahim, “Simple Adaptive Median Filter for the Removal of Impulse Noise from Highly Corrupted Images”, IEEE Transactions on Consumer Electronics, Vol. 54, No. 4.
- Nitish Zulpe and Vrushsen Pawar, “GLCM Textural Features for Brain Tumor Classification”, IJCSI International Journal of Computer Science Issues, Vol. 9, Issue 3, No 3
- Prof. Chandrakant Mahobiya, “MR Image classification using adaboost for brain tumor type”, 2017 IEEE 7th International Advance Computing Conference (IACC).

Acknowledgment

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Thank you for your time and attention!

I'm happy to take any questions.



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