

MEDICAL IMAGE PROCESSING

Brain Tumor Detection.

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INTRODUCTION

What is a brain tumor?

A brain tumor is a collection, or mass, of abnormal cells in your brain. Your skull, which encloses your brain, is very rigid. Any growth inside such a restricted space can cause problems. Brain tumors can be cancerous (malignant) or noncancerous (benign). When benign or malignant tumors grow, they can cause the pressure inside your skull to increase. This can cause brain damage, and it can be life-threatening. Brain tumors are categorized as primary or secondary. A primary brain tumor originates in your brain. Many primary brain tumors are benign. A secondary brain tumor, also known as a metastatic brain tumor, occurs when cancer cells spread to your brain from another organ, such as your lung or breast.

What are the symptoms of a brain tumor?

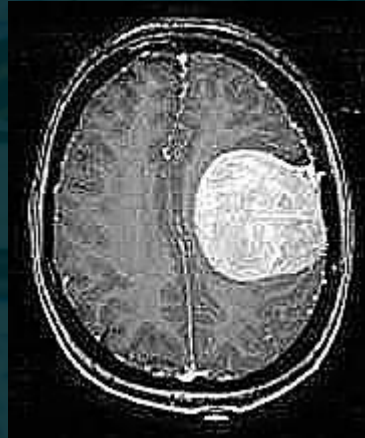
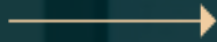
Symptoms of brain tumors depend on the location and size of the tumor. Some tumors cause direct damage by invading brain tissue and some tumors cause pressure on the surrounding brain. You'll have noticeable symptoms when a growing tumor is putting pressure on your brain tissue.

METHODOLOGY

1. Image Pre-Processing



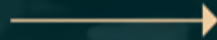
Pre-processing
Gray - level



2- Histogram equalization image



Histogram
equalization

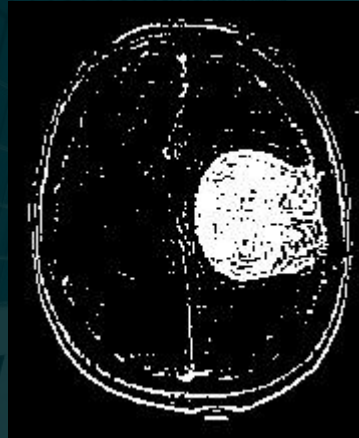
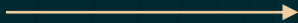


RESULT

3- threshold segmentation image



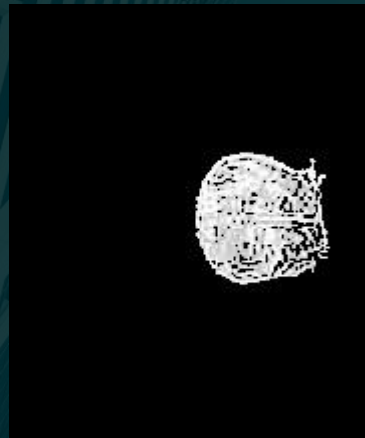
threshold image



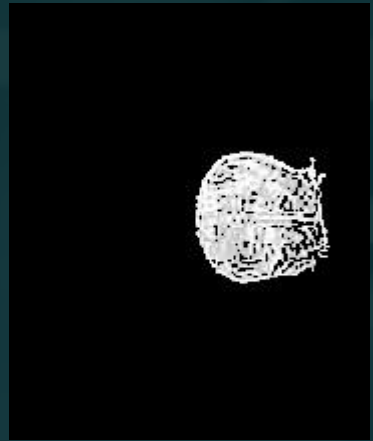
4- Enhancement image



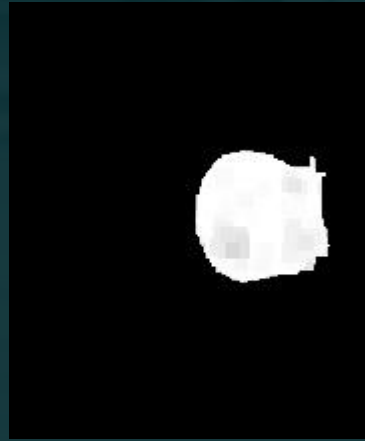
brain mask



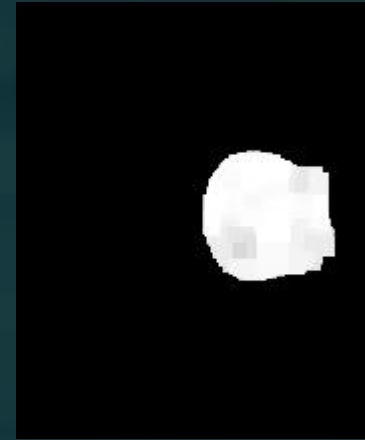
5- Morphological operations image.



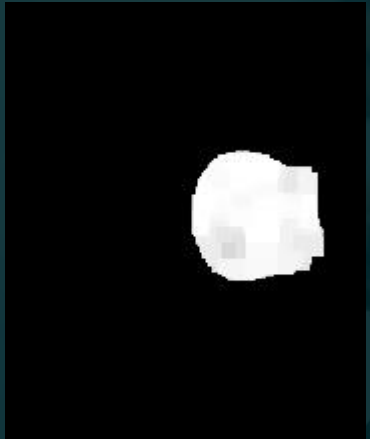
**Morphological
operations
(closing)**



**Morphological
operations
(opening)**



6- labeling image



labeling



Result Accuracy

	Predicted as non-tumor	Predicted as tumor
Actual non tumor	TN=35	FP=6
Actual tumor	FN=5	TP=45

$$\begin{aligned}\text{Accuracy} &= (TP+TN)/N \\ &= (45+35)/91=87.7\%\end{aligned}$$

$$N = (45+35+6+5) = 91$$

CONCLUSION

we presented a method for image acquisition, image pre-processing using median and high pass and label filtering, image enhancement using histogram equalization, segmentation using threshold and morphological operations therefore the detection of the tumor. Some of the features of the tumor are detected which will be helpful in medical applications. The future works involve the segmentation and detection of more images with more features which help in classifying several types of the tumors.

THANK YOU

