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Improving Brain Tumor MRI Images with Pre-Processing Techniques for Noise Removal

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Abstract:

The brain is a significant organ of the body that the nervous system regulates. Any system must be capable of detecting and analysing brain tumors, as demonstrated by the results of years of thorough study and procedural development. To increase the precision of tumor detection, this endeavour must incorporate an efficient automated system with powerful pre-processing. Techniques for noise reduction and enhancement are crucial in digital image processing. Brain cancers are frequently identified using magnetic resonance imaging (MRI) images. In this article, a method for pre-processing brain tumor images is suggested to analyse brain tumors. For the preparation of brain MRI images, several filters are applied. This study evaluates several filters using the outcome values to determine the optimum pre-processing.

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I. Introduction

A brain tumor is one of the conditions that medical researchers are most afraid of. According to the American Cancer Society, there are 23,820 diagnoses of malignant brain or spinal cord tumors in the country in 2019 (13,410 in men and 10,410 in women). These projections do not account for benign (non-cancerous) tumors. They calculated that brain and spinal cord cancers could cause 17,760 deaths in 2019 (9,910 males and 7,850 females). The type of tumor and the patient's age have an impact on the survival rate of a brain tumor [1]. Benign and malignant tumors are the two categories into which brain tumors are majorly divided. Because benign tumors are not hazardous. On the other hand, malignant tumors are cancerous and quickly invade different parts of the body [2].

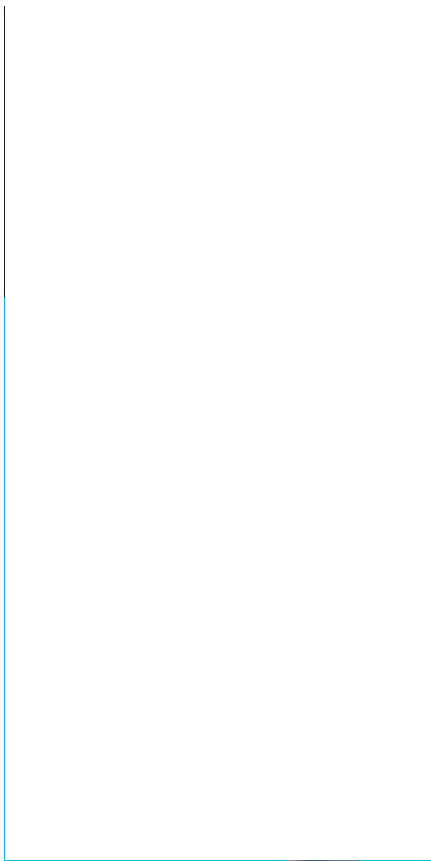
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 2009 IEEE International Symposium on Signal Processing and Information Technology (ISSPIT)
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 IEEE Transactions on Medical Imaging
 Published: 2009

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