VISVESVARAYA TECHNOLOGICAL UNIVERSITY
BELGAUM, KARNATAKA

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"DETECTION OF BRAIN TUMOR USING IMAGE PROCESSING TECHNIQUES"

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ABSTRACT

In the evolution of healthcare services, there is an increasing need for greater effective use of imaging data in medical diagnosis and individual risk assessment, treatment selection, and disease prevention. One of the challenges is to develop software with intelligence to combine imaging technology with a workable diagnostic system that is capable of detecting tumors in its early stages. It is believed that diagnostic research-based patient-oriented system with the capability to distinguish the presence of tumors on medical images of healthy people and cancer patients will be one of the most pressing issues in the near future.

The aim of this project is to detect the presence and shape of brain tumors using image processing techniques. Segmentation of anatomical regions of the brain is the fundamental problem in medical image analysis. There are various methods of segmentation like thresholding, region growing, clustering, etc. The watershed transform is one of the most powerful tools for image segmentation and can be classified as a region-based segmentation approach. The intuitive idea underlying the watershed notion comes from the field of topography. We have used here iterative watershed segmentation, which is fast, efficient and reproducible.

In this project, we present a novel semi automatic segmentation method for detection of brain tumor and its shape from MRI (Magnetic Resonance Image) of a patient. MRI provides non-invasive, high quality images of neuro-anatomy and disease processes. First, we preprocess the image, which removes any noise if present and does contrast enhancement. We use here a simple knowledge model for the image which provides high level information. Finally, we use marker-based iterative watershed algorithm to detect brain tumor and its shape. The proposed method was tested on different images and the results were quite encouraging.