Representation of 3D View of Tumor from 2D Images Using Watershed Algorithm

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Abstract 3D image visualization gives the detailed information of MR images. In this paper, 2D images of different patients have been taken and these are preprocessed, segmented and post-processed. The preprocessing steps include thresholding and skull stripping. Watershed algorithm is applied for segmentation, stacking is performed to arrange different slices of tumor in shape, and interpolation is done to get smoothness between different slices of tumor and lastly rendering (Phong shading applied) which gives realness to the shape of tumor. The developed strategy has been tested on MATLAB 2013a software platform. The dataset of different patients had been taken having no tumor, less tumor, and high tumor.

Keywords Watershed segmentation · Interpolation · Stacking · Phong shading

1 Introduction

Brain tumor is very dangerous as it spreads at very fast speed and it proves a very serious threat to life. For this reason, calculating the volume of tumor is very essential to calculate the stage of tumor. Magnetic resonance imaging (MRI) is the common analysis of the brain tumor, and the combined use of radio waves and magnetic fields gives cross-sectional images of the brain that gives anatomic details of the 3D tumor which are presented as a set of 2D parallel cross-sectional images. 2D MR images of brain tumor do not prove very successful for visualizing the tumor. Interpretations of these images are very difficult to radiologist, which results in a need for 3D reconstruction of the tumor from a set of 2D parallel

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