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**Mini Project Phase III**

**1]Problem Statement**

BIOMEDICAL IMAGE ANALYSIS USING SEMANTIC SEGMENTATION

Semantic Segmentation is a very active area of research in the examining the medical images. The failure in the conventional segmentation methods to preserve the full resolution throughout the network led to the research’s that developed methods to protect the resolution of the images. The proposed method involves the semantic segmentation model for the biomedical images by utilizing the encoder/decoder structure to down sample the spatial resolution of the input data and develop a lower resolution feature mapping that are very effective at distinguishing between the classes and then perform the up samples to have a full-resolution segmentation map of the biomedical images reducing the diagnostic time. The frame work put forth utilizes a pixel to pixel fully trained cascaded convolutional neural network for the task of image segmentation. The evaluation biomedical image analysis using the semantic segmentation shows the performance improvement achieved by the minimization of the time required in testing and the augmentation in the analysis performed by the radiologist.

**2]Proposed Solution**

This project aims to develop a robust and accurate semantic segmentation model for biomedical image analysis. Semantic segmentation is a computer vision technique that assigns a class label to each pixel in an image, allowing for fine-grained object delineation in medical images. The project will involve data collection, preprocessing, model development, and evaluation.

**3] Code**

% read the mri image.

* k=imread("images.jpeg");
* % display the image.
* imtool(k,[]);
* % convert it into binary image.
* k1=im2bw(k,graythresh(k));
* % display the binary image.
* imtool(k1);
* % Make the brain largest connected component.
* % We need to apply opening operation.
* % define the structuring element.
* SE=strel('disk',7,4);
* % apply the opening operation.
* k2=imopen(k1,SE);
* % display the image now.
* imtool(k2);
* % apply connected component analysis.
* b=bwlabel(k2);
* % display the colored map image.
* imtool(b,[]);
* % brain is component labeled as 9.
* % set all other component as 0 except brain.
* b(b~=9)=0;
* % display the brain part.
* imtool(b);
* % inside the brain part, black portion is there.
* % close the black pixels inside brain part.
* k3=imclose(b,strel('disk',18));
* % display the brain part.
* imtool(k3);
* % extract the brain from original image.
* k4=k3.\*double(k);
* % display the real brain from original image.
* imtool(k4,[]);

**4] Snapshots**

