**Support Vector Machine**

1. Creating Training dataset – **Traindata.m**

i. Number of images = fCount ;

featuresmat is a matrix that stores the extracted features of each image ;

type is an array to store the type of image (Tumour or non-tumour)

ii. CheckImage(fIndex) function returns the 4 features of the image at the fIndex position:

Step 1: Read image

Step 2: Apply median filter on image I as a preprocessing step

Step 3: Perform Fuzzy C-means segmentation on the median filtered image

Step 4: The features of the segmented image are extracted using featurext(image) and stored in e1.

The 4 properties (energy, contrast, homogeneity, correlation) of each image extracted using GLCM (graycomatrix(image)). This value is returned as e1.

Step 5: The 4 properties are then returned as an array.

iii. The properties are copied to featuresmat matrix.

iv. The matrix is normalized

v. The features and known class of images are saved into the training dataset in a .mat file

2. Creating Testing dataset - **Testdata.m**

(same process as Training dataset. Type is not provided as the SVM model will predict it. It uses a CheckImage1() function which performs almost the same process as CheckImage())

3. **simplesvm.m**

i. Train SVM model based on Training dataset

SVMModel = fitcsvm(featuresmat,C);

This function is used after loading the training dataset. It trains the model.

ii. Predict Test data using SVM model –

After the model is trained, the testing dataset is loaded. The predict() function returns an array with the detected class of the images in the test data.

label = predict(SVMModel,featuresmat);