PROJECT

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Topic: Brain Tumor Detection and Classification with Feed Forward Back-Propagation Neural Network

Guide: Ms. Ayana Ajith

About project:

In recent years, brain tumor is very serious disease which causes demise of individuals. Brain is an organ that controls activities of all the parts of the body. Growth of abnormal cells of brain leads to brain tumor. Brain tumor is more curable and treatable if detected at early stage. The diagnosis of brain tumor is difficult because of the diversity in shape, size and location in the brain. Detection of tumor can be done by MRI and CT scan. MRI give high quality images of the body parts and is often used while treating tumors. There are many methods to building completely mechanized computer aided diagnosis (CAD) framework to help therapeutic experts in recognizing and diagnosing brain tumor. Different stages in brain tumor detection are Image Acquisition, Image Preprocessing, Feature Extraction, Image Segmentation and Classification. Previous methods for tumor detection are time consuming and less accurate.

In this project , Haar wavelet transform is used for the noise removal. Then Statistical analysis, Correlation matrix, Morphological operations are used for feature extraction.Statistical property of filtering images is predicted , that includes mean, variance and entropy. Then Correlation coefficient matrix detects the part of high intensity area where tumor is present. This is done by compairing neighbourhood gray level pixels in image. Each pixel representing intensity value. Compairing these value with threshold value.If intensity values greater than threshold value consider that area as tumor location. There amount of white pixels should be high. So easy to isolate and detect the shapes and desired portions significantly. The quality of the process of feature extracting affects the classification process. The morphological operations are applied with respect to shape of tumor. Shape is essential to differentiate between kinds of tumors and to know its active growth model. Fast Bounding Box technique (FBB) used to locating tumor, then Segmentation done by thresholding. Easy to extract features like size and location. FBB uses a novel score function

Bhattacharyas Coeficient (BC) to detect the bounding boxs parallel axes points which forms the box which inscribe the tumor portion differentiate it with the other portion of the image. Block matching technique with FFBP used to training and testing. Feed forward Back propagation neural network is a multi-level error feed-back network that reduces error rate. Well design and training of ANN make it qualified for decision making operations when it faced with new data. This method results high accuracy and less iterations detection which further reduces the consumption time. This automatic segmentation algorithm gives shape, size and location of the tumor more accurately. Classifying brain MRI into normal and abnormal cases.

PUBLICATIONS

- Paper - Study on Brain tumor Detection Techniques
  Conference - ICICT 2018
  Journal – IEEE
  Status - Presented