Abstract

Segmentation of images holds an important position in the area of image processing. It becomes more important while typically dealing with medical images, magnetic resonance (MR) imaging offers more accurate information for medical examination than other medical images such as X-ray, ultrasonic and CT images. Tumor segmentation from MRI data is an important but time consuming task performed manually by medical experts when compared with modern day’s high speed computing machines which enable us to visually observe the volume and location of unwanted tissues. One of the reasons behind the inferior segmentation efficiency is the presence of artifacts in the MR images. One such artifact is the extracranial tissues (skull). These extracranial tissues often interfere with the normal tissues during segmentation that accounts for the inferior segmentation efficiency. This paper deals with an efficient segmentation algorithm for extracting brain tumors in magnetic resonance images using hidden
Markov Gauss Mixture Model (HMGMM) with Genetic algorithm (GA). HMGMMs incorporate supervised learning, fitting the observation probability distribution given by each class using Gaussian mixture model. The GA and Expectation Maximization (EM) algorithms are used to obtain an HMM model with optimized number of states in the HMM models and its model parameters brain tumor extraction.

Reference

- Shanthi K. J, Dr. M. Sasi Kumar “Skull Stripping and Automatic Segmentation of Brain MRI Using Seed Growth and Threshold Techniques” International Conference on Intelligent and Advanced Systems 2007
- Suman Tatiraju, Avi Mehta “Image Segmentation using k-means clustering, EM and Normalized Cuts”, University Of California – Irvine

Index Terms

Computer Science
Bio-informatics

Key words
Gaussian Mixture Model
Hidden Markov Model
Isolation of Brain Tumor Segment using HMGMM

Expectation Maximization algorithm

Genetic algorithm