Segmentation of Liver Using Random Forest Classifier

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Abstract : Nowadays, Medical imaging has become an integral part of modern healthcare. Abdominal CT images are an invaluable mean for abdominal organ investigation and have been widely studied in the recent years. Diagnosis of liver pathologies is one of the major areas of current interests in the field of medical image processing and is still an open problem. To deeply study and diagnose the liver, segmentation of liver is done to identify which part of the liver is mostly affected. Manual segmentation of the liver in CT images is time-consuming and suffers from inter- and intra-observer differences. However, automatic or semi-automatic computer aided segmentation of the Liver is a challenging task due to inter-patient Liver shape and size variability. In this paper, we present a technique for automatic segmenting the liver from CT images using Random Forest Classifier. Random forests or random decision forests are an ensemble learning method for classification that operate by constructing a multitude of decision trees at training time and outputting the class that is the mode of the classes of the individual trees. After comparing with various other techniques, it was found that Random Forest Classifier provide a better segmentation results with respect to accuracy and speed. We have done the validation of our results using various techniques and it shows above 89% accuracy in all the cases.

Keywords : CT images, image validation, random forest, segmentation

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