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APPLICATION OF IMAGEJ MACHINE LEARNING TO PIXEL BASED IMAGE SEGMENTATION

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ABSTRACT

Image annotation and segmentation are fundamentally critical aspects in many visual processing applications and image-based medical computer-aided diagnosis (CAD) systems. Accurate annotation and segmentation of acquired large bio medical (MRI) image datasets are obtainable, precise annotating, identifying and quantifying of such structures in bio medical images can provide an estimation of common disease. However, tools for detecting and quantifying the diseases are not yet available. Quantitative analysis of the data often involves manual annotation and segmentation of the structures of interest. Manual annotation and segmentation is generally orders-of-magnitude more time consuming than automated annotation and segmentation, frequently making handling large images intractable and often a major constriction in the evaluation routine. A machine learning-based approach, introduced the Trainable Weka Segmentation (TWS), a machine learning tool that leverages a limited number of manual annotations in order to train a classifier and segment the remaining data automatically was implored to overcome the problem of time consumption by training a classifier. The images pixel value are categorized basically into three before classification. The segmentation technique explored is the pixel based segmentation (Region based) technique which involves assigning pixels to one region or another, and the edges are defined implicitly. Each of these can be further split into global and incremental methods. Global methods perform the segmentation globally, for every pixel in the image. Incremental methods generally start with a seed pixel and then extend the edge or region by adding neighboring pixels. A set of input pixels that has been labeled is represented in the feature space and then used as the training set for a selected classifier. Once the classifier is trained, it can be used to classify either the rest of the input pixels or completely new image data. In addition, TWS can provide unsupervised segmentation learning schemes (clustering) and can be tailored to employ user-selected image features or classifiers.