

Feature extraction of kidney ultrasound images based on intensity histogram and gray level co-occurrence matrix

Abstract

This study proposes an approach of feature extraction of kidney ultrasound images based on five intensity histogram features and nineteen gray level co-occurrence matrix (GLCM) features. Kidney ultrasound images were divided into four different groups; normal (NR), bacterial infection (BI), cystic disease (CD) and kidney stones (KS). Before feature extraction, the images were initially preprocessed for preserving pixels of interest prior to feature extraction. Preprocessing techniques including region of interest cropping, contour detection, image rotation and background removal, have been applied. Test result shows that kurtosis, mean, skewness, cluster shades and cluster prominence dominates over other parameters. After normalization, KS group has highest value of kurtosis (1.000) and lowest value of cluster shades (0.238) and mean (0.649) while NR group has highest value of mean (1.000), skewness (1.000), cluster shades (1.000) and cluster prominence (1.000). CD group has the lowest value of skewness (0.625) and BI has the lowest value of kurtosis (0.542). This shows that these features can be used to classify kidney ultrasound images into different groups for creating database of kidney ultrasound images with different pathologies.