

Thesis Title	Texture Based Classification Of High Resolution Remotely Sensed Imagery Using Weber Local Descriptor
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Abstract

With the increasing use of high resolution images for remote sensing image analysis, texture has become a critical characteristic to be utilized in improving classification. This is due to limitations of conventional pixel-based classification with such images, in which regions that represent a single class often contain pixels with widely varying image values. In this study.

We apply the relatively new and robust Weber Local descriptor (WLD) to high resolution remote sensing through supervised Per-pixel texture-based classification approach, and compare its performance against well known Local Binary Pattern (LBP) algorithm. Furthermore, we will also try to incorporate Variance (VAR) texture descriptor on WLD with simple concatenation approach, and compare its capability over state of the art Local Binary Pattern Rotation Invariant Uniform Variance (LBPRIUVAR).

Two subsets of panchromatic Quickbird imagery containing several texture classes were selected as the study area. The parameter selection was conducted prior to the main classification process. We found that the best parameter values depended on characteristics of the different study areas. In the main experiment, we found that WLD is robust and also precise in classifying several texture classes, with the high accuracy results compared to the LBP texture descriptor and its rotation invariant version. In the contrast contribution upon WLD, we see a slight contribution when classifying an area with heavy illumination changes. This suggests the VAR descriptor can be combined with WLD in contrast affected areas. The results of WLDVAR outperformed the results of LBPRIUVAR overall. Given its high accuracy results, this texture descriptor is a promising choice in real world applications.

Keywords : Weber Local Descriptor / Texture-Based Classification / Binary Coding / Bhattacharya Distance