Automatic Extraction of Building Outlines from High Resolution Aerial Images
Yandong Wang
1EagleView Technology Corp.

Building outline is important geospatial information for many applications, including planning, GIS, tax assessment, insurance, etc. Extracting buildings/building outlines automatically from digital images has been an active research area in both photogrammetry and computer vision communities for decades. Numerous approaches have been developed to extract buildings automatically from digital imagery or elevation data such as LiDAR data. In this paper, an automatic approach for extraction of building outline from dense point cloud generated from digital imagery is proposed. The proposed method uses both elevation information of objects derived from the imagery using computer technique and spectral information to detect buildings and classify building roof. It consists of four major steps, i.e. generation of point cloud from imagery using semi-global image imaging technology, detection of buildings from the generated point cloud, classification of building roof and creation of building outline in vector format. Automatic generation of point cloud is based on semi-global image matching. Buildings are then detected by checking the gradients of elevation in the differential surface which is generated from the point cloud. Classification of building roof is done by pattern recognition with a number of spectral features which are computed from the pixels. The developed approach is being tested with thousands of images. Some of the test results and their statistical numbers will be presented and discussed in this paper.