**Spatial Accuracy Distribution of High Resolution Satellite Images**

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Very High resolution satellite images provide huge amount of information with high spatial accuracy. Relief displacement is the primary geometric distortion which is uncontrollably effected to spatial accuracy. High-end technology in eliminating this error is the Ortho-rectification with stereo pair images or high resolution digital surface model (DSM). However, due to lack of available data and high cost, current practicing rectification method is Ground Control Point (GCP) base geo-reference. Spatial accuracy of image depends with the quality of GCP and the referencing method. Therefore, in this study, it is going to identify the best suited rectification methods. Meanwhile it is evaluate the spatial accuracy distribution over corrected images, especially in highly undulate terrain.

Well distributed GCP are collected with their terrain height using GPS. High resolution Ortho-photo and DSM is created in same area by using aerial stereo and which is consider as a reference data. Then it introduces a new geo-referencing method base on 3D coordinate other than to existing algorithms. Quick-bird panchromatic image in hilly area is used for this study and image is rectify with several geo rectification algorithms but using same GCPs. Furthermore it is extract the 150 random samples from rectified images and their conjugated point coordinates (X, Y, Z) in Ortho-photo. Finally it is analyzing the positional error variation along x, y direction and terrain height. Then it is compare the RMS error of deferent rectified images.

According to the final result, newly introduce 3D coordinate base geo-rectification method gain lowest error(RMS-7.2 m).Outcome confirm that spatial accuracy has significant correlation(0.69) with the ground elevation and error direction is depend with the viewing geometry and terrain orientation. Finally it is mention that 3D geo-reference is eliminate the majority of spatial displacement in high undulated area and which error is propagate with terrain height difference.

**Key words: Spatial accuracy, 3D Geo- reference, Geometric correction, Remote Sensing**