Automatic keypoints extraction from UAV image with refine and improved scale invariant features transform (RI-SIFT)

ABSTRACT

In this study, the performance of Refine and Improved Scale Invariant Features Transform (RI-SIFT) recently developed and patented to automatically extract key points from UAV images was examined. First the RI- SIFT algorithm was used to detect and extract CPs from two overlapping UAV images. To evaluate the performance of RI-SIFT, the original SIFT which employs nearest neighbour (NN) algorithms was used to extract keypoints from the same adjacent UA V images. Finally, the quality of the points extracted with RI- SIFT was evaluated by feeding them into polynomial, adjust, and spline transform mosaicing algorithms to stitch the images. The result indicates that RI-SIFT performed better than SIFT and NN with 271, 1415, and 1557points extracted respectively. Also, spline transform gives the most accurate mosaicked image with subpixel RMSE value of 1.0925 pixels equivalent to 0.10051m, followed by adjust transform with root mean square error (RSME) value of 1.956821 pixel (0.17611m) while polynomial transform produced the least accuracy result.