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Registration of Multi-Temporal Unmanned Aerial Vehicle Images for Facility Monitoring

Authors : Dongyeob Han, Jungwon Huh, Quang Huy Tran, Choonghyun Kang

Abstract : Unmanned Aerial Vehicles (UAVs) have been used for surveillance, monitoring, inspection, and mapping. In this paper, we present a systematic approach for automatic registration of UAV images for monitoring facilities such as building, green house, and civil structures. The two-step process is applied; 1) an image matching technique based on SURF (Speeded up Robust Feature) and RANSAC (Random Sample Consensus), 2) bundle adjustment of multi-temporal images. Image matching to find corresponding points is one of the most important steps for the precise registration of multi-temporal images. We used the SURF algorithm to find a quick and effective matching points. RANSAC algorithm was used in the process of finding matching points between images and in the bundle adjustment process. Experimental results from UAV images showed that our approach has a good accuracy to be applied to the change detection of facility.

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