Building Reconstruction by UAV and Multi-view Images and Application on Augmented Reality

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ABSTRACT: Photogrammetry is the most common method to construct DSM currently. In recent years, the technique of the Airborne LiDar has been developed rapidly, so it is also treated as a good tool for obtaining DSM. However, they cost much more expenses, easy to be influenced by weather as well as aerial height and do not have high mobility. Photogrammetry, close-range photogrammetry and LiDar are also the major methods of 3D building reconstruction. Besides, result maps of building survey is often the sources for reconstruction as well. Each of the method is different in convenience, advantage and disadvantage, as well as the field of applying. This research will be deeper and extended much further by three economical and convenient methods, based on the research I had done before, to produce DSM and 3D building reconstruction. The resources for all of the three methods are the images took by Unmanned Aerial Vehicle (UAV). The research will focus on the generation of DSM, reconstruction of 3D buildings and integration of the outcome with Augment Reality (AR). Except for using CSIFT+SfM as before, （1）the process by the Bundler and （2）the substitution of SURF for feature extraction by SIFT are added to this research in order to generate DSM. The research will evaluate the software and develop a marked AR. After accomplishment, it will turn from passive to active observation about the urban planning and the display of design. After then, the markless AR will be tried based on development of marked AR. Because the markless way of determining coordinate demands efficient and reliable technique of feature extraction, the research this term will adopt the method of CSIFT and SURF to extract the nature features. The accomplishment of the research will broaden and widen the field because it no longer rely on specific mark anymore.