



Applications of photogrammetry for small-scaled Houshanyue landslides, northern Taiwan

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Over 70% of Taiwan land area is covered with mountain slopes. Also the recent years population continued to increase, the flat land potential regions gradually deplete. Therefore, hillside places need to be used increasingly. Due to the improper design and human overuses, landslides and slope failures have occurred frequently over the past few years. The study site, Mt. Houshanyue hiking trail, collapsed after the Kalmaegi typhoon (July 2008) and the Sinlaku typhoon (September 2008). This study try to decipher the change of landform before and after disasters, thus, 3D data acquisition technologies, such as Airborne LiDAR, Unmanned Aerial Vehicle (UAV), Aerial Photogrammetry and GPS were compiled together. We firstly construct the six different Digital Terrain Model (DTM) from 2008-2012, based on 2m resolution LiDAR image taken in 2005 (before landslide). The precision and the accuracy of the aerial triangulation parameters were estimated according to the pre-landslide LiDAR DSM and DEM. In the meanwhile, the quality of the aerial photo derived DSM is analyzed, and the landslide cut-and-fill volumes is estimated accordingly. The calculated the slide volume is about 0.2 million cubic meters within an area of 5.8 hectares. The depth of the sliding surface is about 14m. On the other hand, the number of the sliding mass is a debate issue. This study demonstrates/suggests a single landslide by means of image correlation from the orthorectified images taken in different periods.