

UAV Based Monitoring of Adatepe Landslide, Canakkale, NW Turkey

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SUMMARY

Unmanned Aerial Vehicle (UAV) based photogrammetry has been studied for many years in order to monitor and analyze of changes in the surface characteristics and topography of landslides between different dates. We can easily obtain the displacement rate and extend by the comparison of digital surface models of landslide area derived from UAV based photogrammetry. Furthermore, the ortho-mosaics provide opportunities for analyzing sliding materials and also fissure structure of landslide. In this study, we used a low-cost UAV equipment and digital cameras. The Adatepe Landslide is one of the active landslides in Canakkale and the last activity is occurred on November 15th 2013. The landslide is with an average of 22° slope. We took significant numbers of aerial photographs of the Adatepe Landslide (Canakkale, NW Turkey) during campaign of the UAV based photogrammetry. Using plane image rectification methods, we combined these photographs to an ortho-mosaic. The number of photographs is 42 and 367 for toe region and entire landslide. Note that we obtained two different digital surface models of the Adatepe Landslide by merging aerial photographs to an ortho mosaic by using plane rectifications, i.e. one of the entire landslide and one of the toe region. Finally The generated ortho-mosaic covers the entire sliding area of the Adatepe Landslide with a resolution in level of cm. According to the results, the density of point of our model changes from 0 to 50 points per m². The density of point of the digital surface model of the entire landslide can be shown in the prepared thematic maps. We propose to use the UAV based photogrammetry for analyzing and monitoring the active landslides. The current landslide activity can be obtained by comparing digital surface models for different dates.