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# Topographic Data Acquisition and Reduction for Landslides Modeling using UAV-LiDAR System

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Landslide occurrence becomes more frequent and the magnitude and scale grow larger in association with recent global climate change, and it is considered one of the most severe geohazards. However, insufficient topographic information on natural slopes often hampers reliable prediction of landslides. The most widely used topographic information, the digital elevation model (DEM), is mostly obtained by aerial survey, but it is fairly expensive and the frequency of updates is too low. Meanwhile, recent technological advancement in a drone-LiDAR (Light Detection And Ranging) system allows the generation of high resolution 3D point cloud map, which can be used to generate DEM with richer information. Because such a drone-LiDAR system is fairly economical, this provides various benefits, including that the acquisition of DEM right after the debris event is fairly affordable. In this study, a drone-LiDAR system is presented to acquire 3D point clouds and topographic information, including DEM and the digital surface model (DSM). The acquired data from some test sites, including three catchment basins—a catchment basin with the occurrence of past debris flow events, a catchment basin without the event, and a catchment basin with the debris flow barrier—are shown, and the acquired terrain information are analyzed further in related to topographic characteristics of catchment basins. The system we built can be used not only for landslide prediction, but also for countermeasure facility maintenance.