Landslide Occurrence Factor Analysis with Multi-Resolution data set Derived from LiDAR in Southern Taiwan

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Taiwan has experienced several landslide disasters induced by extremely heavy rainfall recently. Alishan Highway, the road to the popular tourist destination of Alishan National Scenic Area, is one of the highest landslide susceptible area in southern Taiwan. During Typhoon Morakot, in 2009, the intense rainfall triggered several landslides and the highway had been destroyed for several months. Because the accuracy rate of landslide predicting model requires several parameters and each of it shown their significance at different spatial scales. Our purpose is to determine the optimum scale of each parameter and find the optimal combinations to address and forecast the occurrence of landslide. In this study, we have extracted 24 landslide-conditioning factors from 1, 5, 10, 30, 60, 90, 150 and 300m spacing DEMs derived by a LiDAR dataset (collected in 2015). We apply the hybrid model including artificial neural network (ANN) and genetic algorithm (GA) to detect the newly landslide area by the outcome of training set. The results provided an optimal parameter-scale to the landslide catalog and those combinations will be a useful method to improve landslide analysis accuracy and understanding the conditions of slope failure within the study area with much detail information.