



## **Landslide detection using LiDAR data and data mining technology: Ali Mountain Highway case study (Taiwan)**

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Taiwan mountains are severely affected each year by landslides, rock falls, and debris flows where the roads system suffer the most critical consequences. Among all mountain highways, Ali Highway, located into the main entrance of Alishan Mountain region, is one of the most landslide-prone areas in southern Taiwan. During the typhoon season, between May and August, the probability of occurrence of mass movements is at higher level than usual seeing great erosion rates. In fact, during Typhoon Morakot, in 2009, the intense rainfall caused abrupt interruption of the circulation for three months triggering several landslides (Liu et al. 2012). The topographic features such as slope, roughness and curvature among others have been extracted from 1 m DTM derived by a LiDAR dataset (collected in 2015) to investigate the slope failures along the Ali Mountain Highway. The high-resolution DTM highlighted that the hydrogeomorphological (e.g. density of stream, the distance from the ridge and terrain) features are one of the most influencing factors affecting the change and the instability of the slopes. To detect the landslide area, the decision tree classifier and the random forest algorithm (RF) have been adopted. The results provided a suitable analysis of the area involved in the failure. This will be a useful step in the understanding (and management) landslide processes of study area.

### References

Liu CN, Dong JJ, Chen CJ, Lee WF (2012) Typical landslides and related mechanisms in Ali Mountain highway induced by typhoon Morakot: Perspectives from engineering geology. *Landslides* 9:239–254.