

Monitoring the Roncovetro Landslide with a SARP F550-SonyNEX5 system

Technical Report

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In action C1, INGV is involved by using a UAV-Sony NEX5 system (Figure 1) for updating the existing topography of Roncovetro Landslide and change detection. The 3D model is created from the aerial photos taken by UAV-Sony NEX5 system by using Photoscan Software.



Figure 1. The UAV-Sony NEX5 system

The upgrading of topography is an important issue in assessing the mass wasting and movement of a landslide. For this reason the first proposal of the Wi-GIM project foresaw two LIDAR campaigns, the first one for collecting the topography before the beginning of monitoring with the Wi-GIM system and the other at the end of the period of monitoring. As consequence of budget negotiation, the second LIDAR survey was eliminated and only the first survey has been kept in order to have a high resolution DEM as base for cartography and for the Wi-GIM data. In the meantime the INGV Pisa has gained expertise in generating 3D data of terrain from simple photos by using a technique called “Structure From Motion”. Thanks to one partner of Wi-GIM project (RER) who provided us with aerial photos of the Roncovetro landslide, the first photos were elaborated and the obtained results appear encouraging.

By comparing several possibilities and thanks to good relationship between Blom C.G.R. spa and INGV of Pisa, after haggling about the price of the LIDAR survey we are able to obtain a very competitive price, which was lower than the one declared in the proposal.

For this reason and considering what we had said before, we decided to use the residual funds saved from the airborne LIDAR survey for buying a UAV-Sony NEX5 system in order to collect areal photos above the Roncovetro Landslide. This was done after informing the coordinator, the national contact point and the European Commission.

Thanks to UAV-Sony NEX5 system and without any additional cost for the EU, this low-cost, accurate and flexible methodology can be used for monitoring the landslide for a very long time. The advantages of the use of UAV-Sony NEX5 system for obtaining the topography are:

- 1) The collected data are more accurate than those obtained by aerial photos because the UAV-Sony NEX5 system is more stable;
- 2) The topography has an higher resolution than those obtained by aerial photos because the UAV-Sony NEX5 system can fly at lower altitude;
- 3) The data can be acquired very often because a UAV-Sony NEX5 system survey is very easy to deal with compared with a flight with an aircraft.

Two surveys have been performed up to now. The first one on November 2014 (figure 2), and the second one on April 2015 (figure 3). They have been added to LIDAR survey and to the first two aerial surveys performed by RER. This provides the very high temporal resolution of about one flight every 3 months.

No problems have been encountered during this action. Taking into account the topography of the Roncovetro Landslide can be updated using the UAV-Sony NEX5 system, this action will continue also in the future for showing the topographic changes of the investigated area. The data obtained will bring great advantages to the project and can result in numerous publications and posters.

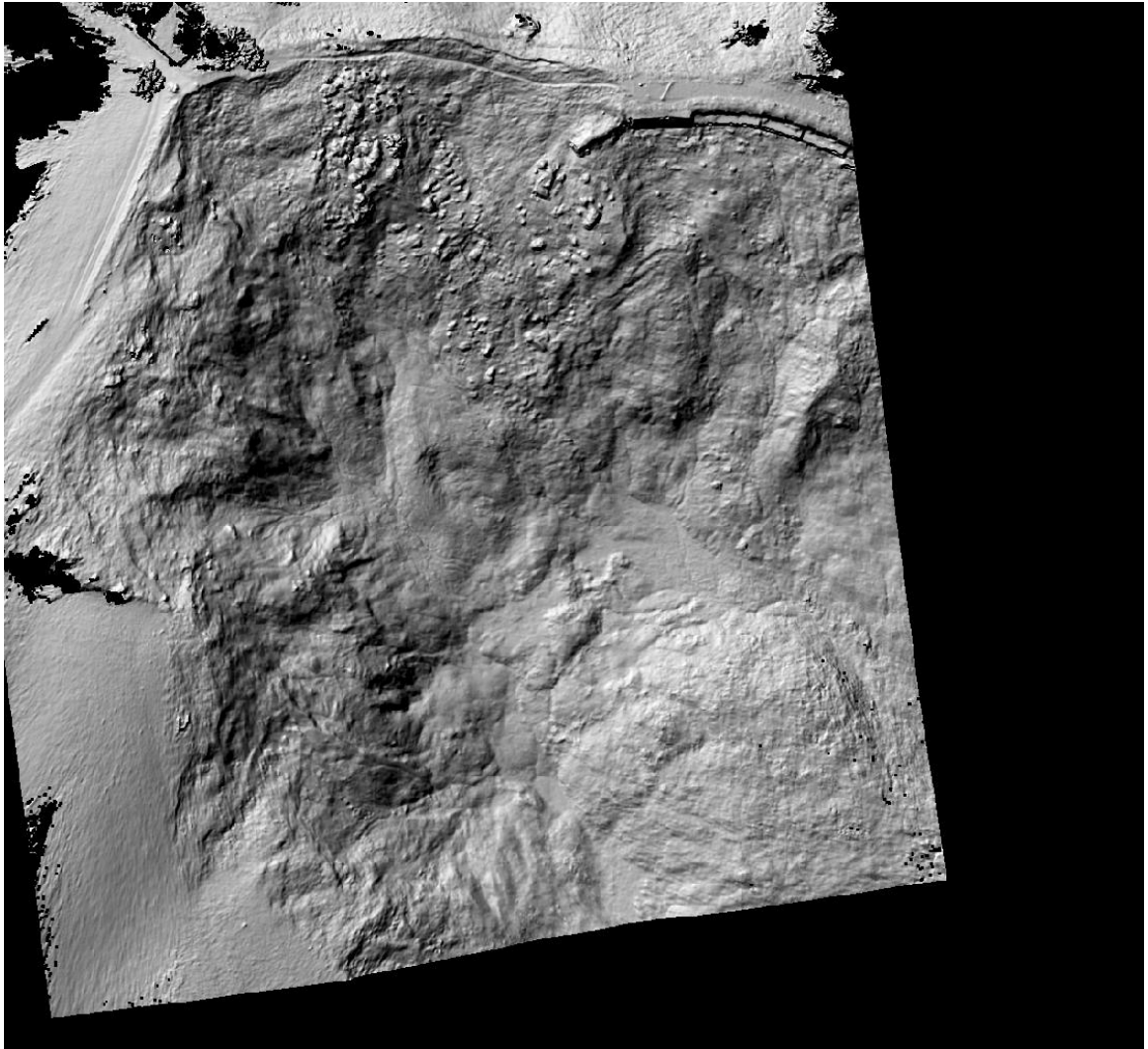


Figure 2.

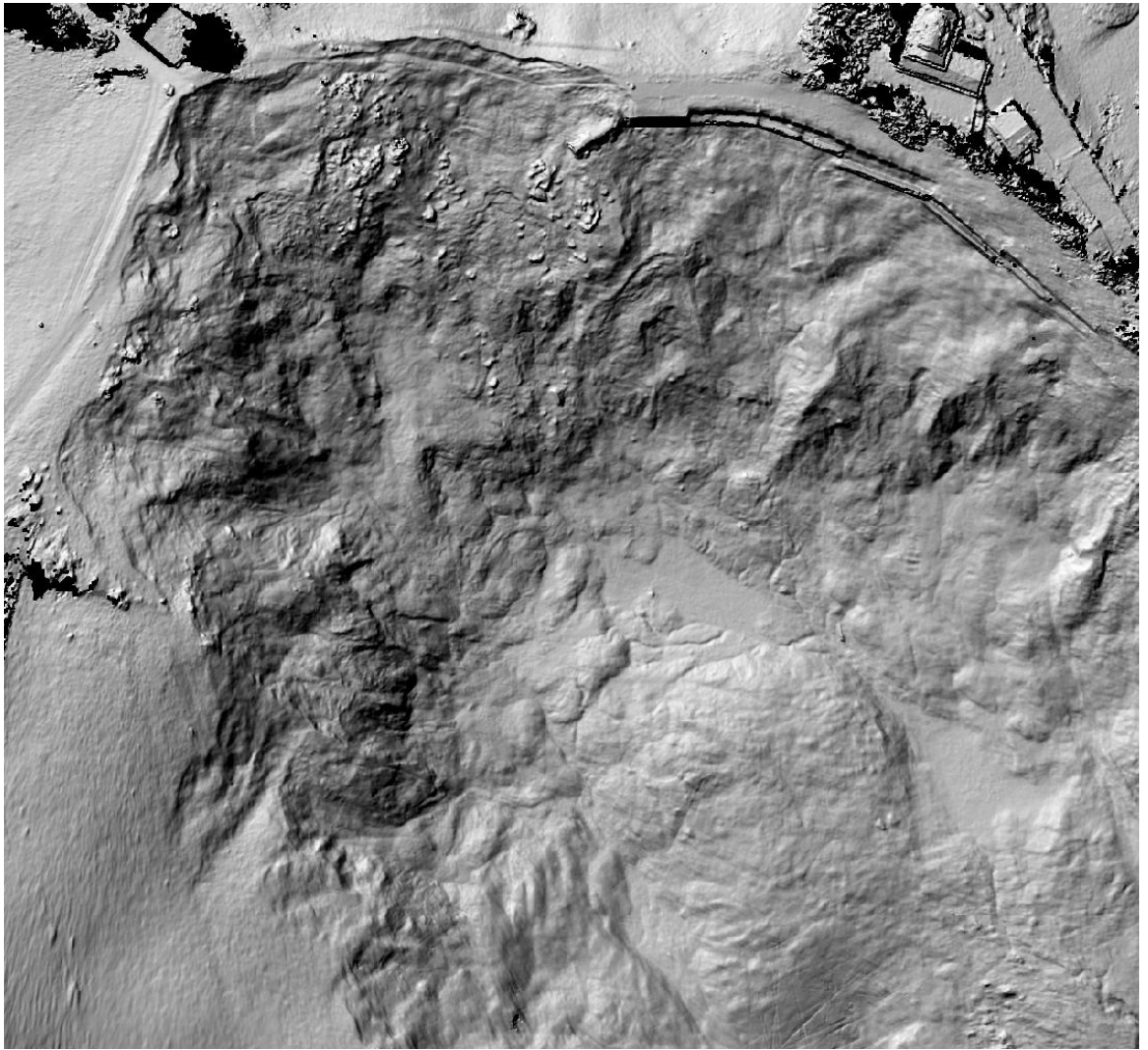


Figure 3