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Methodology in the use of UAV (Unmanned Aerial Vehicles) by Assetto del Territorio sector of Liguria Region.

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Title: Methodology in the use of UAV (Unmanned Aerial Vehicles) by Assetto del Territorio sector of Liguria Region.

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Liguria Region has recently equipped itself with a UAV (Unmanned Aerial Vehicles) system, consisting of a DJI Phantom 4 pro, the choice fell on this type of equipment as it guarantees a good quality for photographic shooting combined with an ease of use deriving from the fact of being designed for a consumer market, in fact this model mounts advanced anti-collision systems on board which make it safe to use even in closed places or near tall trees, the latter being a frequent situation in the use carried out by regional technicians.

In addition, maintenance is facilitated as spare parts (essentially batteries and propellers) can be found easily on the main online sites, given the widespread use of the model.

The use of the drone by the Assetto del Territorio consists mainly of two sectors, terrestrial photogrammetry and aerial photogrammetry.

The intervention scenarios are essentially of two types, survey of existing situations, for example, delimitation of landslides that may or may not have evolved, or the survey of post-disaster situations, both hydraulic and gravitational , it is also possible monitor the evolution of phenomena through multitemporal recovery .

The terrestrial photogrammetry it is so far little used by the Region and regarding the capture of perspective images of buildings, cliffs useful for the relief geomechanical to evaluate rock mass, paleoseismic trenches (for upthrow of fault) etc.

As for the method of data acquisition (images), and the preparation of the flight plan, the DJI GS PRO software for iOS operating systems is used, this software allows to automatically set the flight parameters, simply by drawing on a map the polygon of the area to be surveyed and the flight height, it is also possible to adapt the orientation of the strips to the polygon of the survey.

However, this software does not require the use of a DTM , which takes into account the elevation of the terrain, so in case of relief of slope portions inclined taken the take off from the highest

point since the calculation of the frames overlap is carried out assuming that the ground is flat , if it were not so taking off for example in the lower part it could happen that for purely geometric issues in the top part the overlapping of the frames is insufficient to arrive at a correct processing via software.

As regards the processing of image in order to produce a cloud, depending on the cases of the DTM points and l ' orthophotos the software is normally used Metashape by Agisoft , the workflow typically used is this:

Adding photos

Alignment of photos - maximum resolution

Point cloud creation - medium resolution

DEM creation