

microdrones



microdrones GmbH

Ever Tried to Survey Sawdust?

The Area

The project requires obtaining a 3D model of three shaving mounds. Three possible methods are to be considered:

Classical Survey: This is not possible because the mounds cannot be walked up a person would sink in it. In addition, the mounds are in an area of restricted access that cannot be occupied for any long period of time.

Terrestrial Laser Scanner: There are many obstacles creating blind areas. Too many stations would be required and the amount of time needed to complete the observations and hence the amount of time occupying the area of restricted access and subsequent work would be excessive. It is not impossible, but if another method can be found it is to be preferred.

Low Height Photogrammetry with a microdrone: The area to be covered is small. A microdrone flight above it would require little time. The area only has to be occupied for a short time in order to measure a few control points. The office work

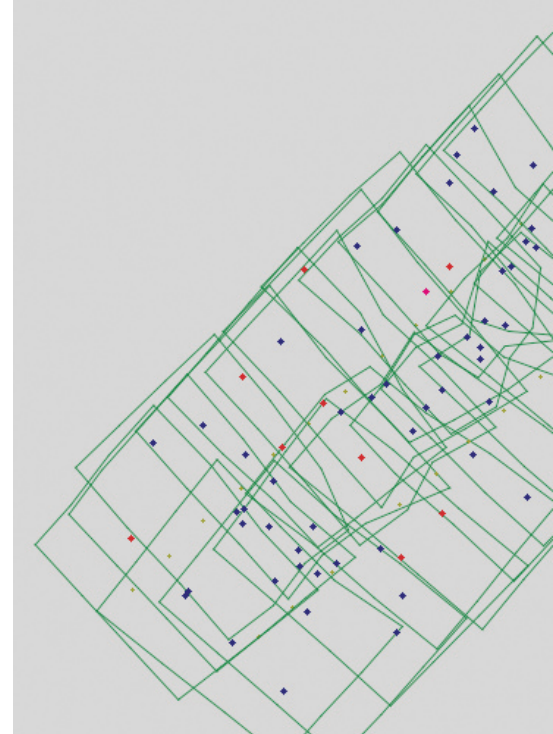
is light too, merely drawing the lines defining the mounds shape. Then the model is formed and the volumes computed by any compatible software tool.

microdrones can operate at small heights not allowed for planes, e.g. 80m. This introduces microdrones to the field of topography, actually achieving topographic precisions. microdrones are ideal for urban areas, medium- or large- sized rural works, or places with difficult access. A shorter time is required to complete the work than topographic methods, providing a more economical alternative.

The Flight

A flight 100m above the object was enough for the required precisions. The ground pixel size is 2.5 cm and the AP 7.5 cm (the camera was mounted in the "short" position).

Two strips were necessary. The flight was programmed with microdrones' own Waypoint Editor integrated in the base station software-suite mdCockpit.



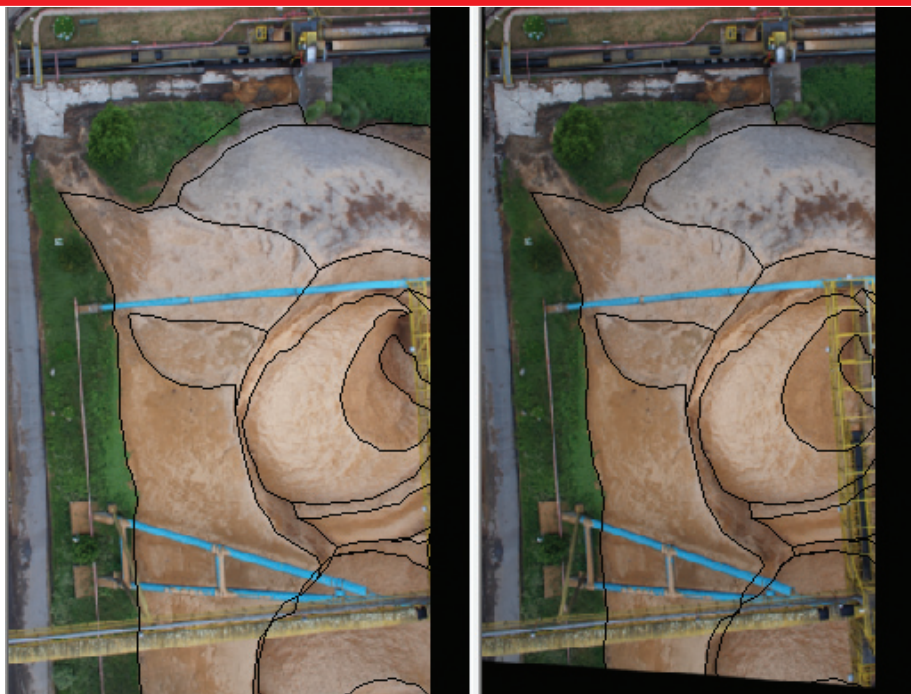
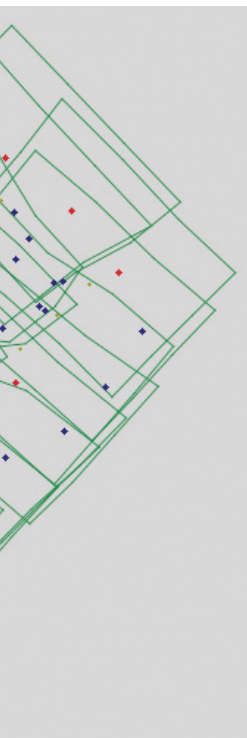
There are 24 photographs. The red points are the control points. These and the blue one are the points measured for the computation of the aerial triangulation.

Many programs offer the possibility to automatically select points and match them along the different photographs where they appear. In this work, due to the characteristics of the object, an automatic process was likely to make many mistakes; therefore, manual measuring was preferred.

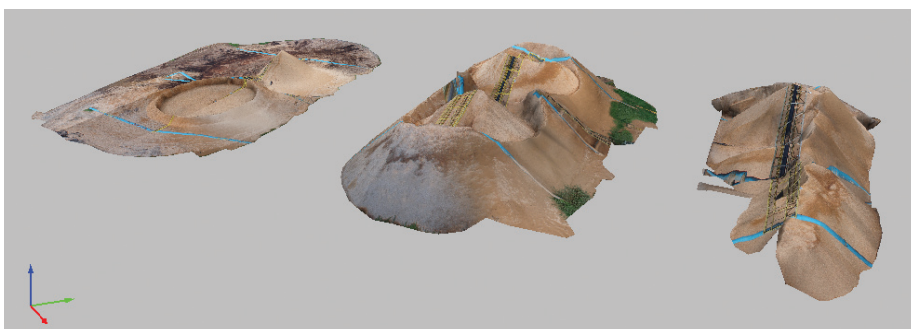
The Creation of the 3D Model

The lines defining the model for each of the three mounds were drawn. This process of drawing 3D elements based on the photographs is called restitution. At each moment the operator is working with a pair

of photographs, which enables the measuring and drawing in 3D.



Below: A perspective view of the whole complex of lines and the model derived thereof. Based on this model the needed volumes were computed. An orthophotograph was neither needed nor interesting for this work.



CORPORATE PROFILE

microdrones GmbH was founded in October 2005. The founders had already been engaged with development of aerial vehicles for several years. Products of microdrones GmbH are the most technologically advanced answer for safe and highly sophisticated operations in the field of aerial reconnaissance.

microdrones are rotary wing VTOL MAVs (VTOL = Vertical Take Off and Landing / MAV = Micro Aerial Vehicle) under 25kg mainly based on the principle of quadcopters. Equipped with high-resolution photo, video, thermo, or multispectral sensors, microdrones significantly simplify the work of geodesists and surveyors.

Permanent access to live video and telemetry give users more than just

an “eye in the sky.” In life-threatening situations or difficult to reach locations, microdrones are fast, quiet, precise, and can help when reaching the limits of traditional surveying capabilities.

Customers of microdrones benefit by a lifetime update and service guarantee. With future products microdrones will introduce even more sophisticated control and communication technologies. The latest microdrone is the md4-1000 which has outstanding capabilities. It is the most efficient UAV in the 5,5 kilo class. With flight times of up to 88 min. and payloads of 1200g it definitely has set new standards.

Cartogalicia

Cartogalicia has extensive experience in the market for surveying and mapping

in Spain and in several other countries around the world. The company is divided into three functional sections. A technical department, sales & services, and management.

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