



SATPALDA GEOSPATIAL SERVICES

ISO 9001:2008



Unmanned Aerial Vehicle/ Drone

Drone or UAV (unmanned aerial vehicle) is an unmanned aircraft, piloted autonomously and controlled by pilot, equipped with a high resolution camera. In recent history, drone data has been used for military and special operation applications but modern technology is using it to manufacture commercial versions for civilian usage. Now, UAV data can be used for urban planning, road and railway corridor mapping, utilities, agriculture and governance requirements.

UAV data can be used for the following geospatial services.

- UAV Photogrammetry
- Aero Triangulation
- Data modeling – DEM / DTM / DSM & Contour
- Orthorectification
- 3D Video Production

UAV Photogrammetry Mapping: Photogrammetry is the science of making measurements from photographs. The output of photogrammetry is typically a 3D map, drawing, measurement, or a 3D model of some real-world object or scene.

Aerial Triangulation: Aerial Triangulation represents the mathematical process of establishing precise and accurate relationships between the individual image coordinate systems and a defined datum and projection (ground).

The main objective of aerial triangulation is to produce from ground controls, sufficient points in the photogrammetric models to ensure that each model can be oriented accurately as required for post processing in either orthophoto or line mapping.

DEM / DTM: Digital Terrain Model (DTM) is a height model of bare earth. It used for contour generation, Digital Elevation Model (DEM) and Orthophoto generation respectively.

Orthorectification: Orthorectification is the process of removing the effects of image perspective (tilt) and relief (terrain) effects for the purpose of creating a planimetrically correct image. The resultant Orthorectified image has a constant scale wherein features are represented in their 'true' positions. This allows for the accurate direct measurement of distances, angles, and areas.

The resulting accuracy of the ortho image is based on the accuracy of the triangulation, the resolution of the source image, and the accuracy of the elevation model.

UAV Videography

Drone Videography is the capturing of video by a remotely-operated or autonomous unmanned aerial vehicle (UAV) as demanded by the client. Drone videography is generally used for Inspection of wind turbines, power lines, pipelines, railroads, highways, buildings, towers and more.

SATPALDA provides drone based products of 2 cm, 5 cm and 10 cm resolution. For Drone ortho photo samples and their specifications. Please contact: Santosh.singh@satpalda.com, info@satpalda.com

UAV Photogrammetry Applications

Mining:

Now a days drone data is used in the mining sector for ores and minerals estimation. Drones fly over the mine and capture the data which is utilized for ores and minerals estimation and is better than manual calculation.

Stockpile, volume calculation:

The biggest challenge for the mining industries is stockpile management. Before drone services, manual ground surveys were conducted, they were time-consuming and expensive. Surveyors physically recorded and moved over the stockpiles, which had multiple errors and lead to wrong volumetric calculation of stockpiles.

Now, controlled mission plans uploaded to the drone are used to collect data. The drone will follow a line pattern to cover the desired area. The data is then transformed into a 3D model. This data will be useful for volumetric analysis, linear distance measurements, generate contour maps, measure area, and create cross-sections and other products.

Mining companies are now frequently using drones because of safety, low cost, reduced manpower and faster processing.

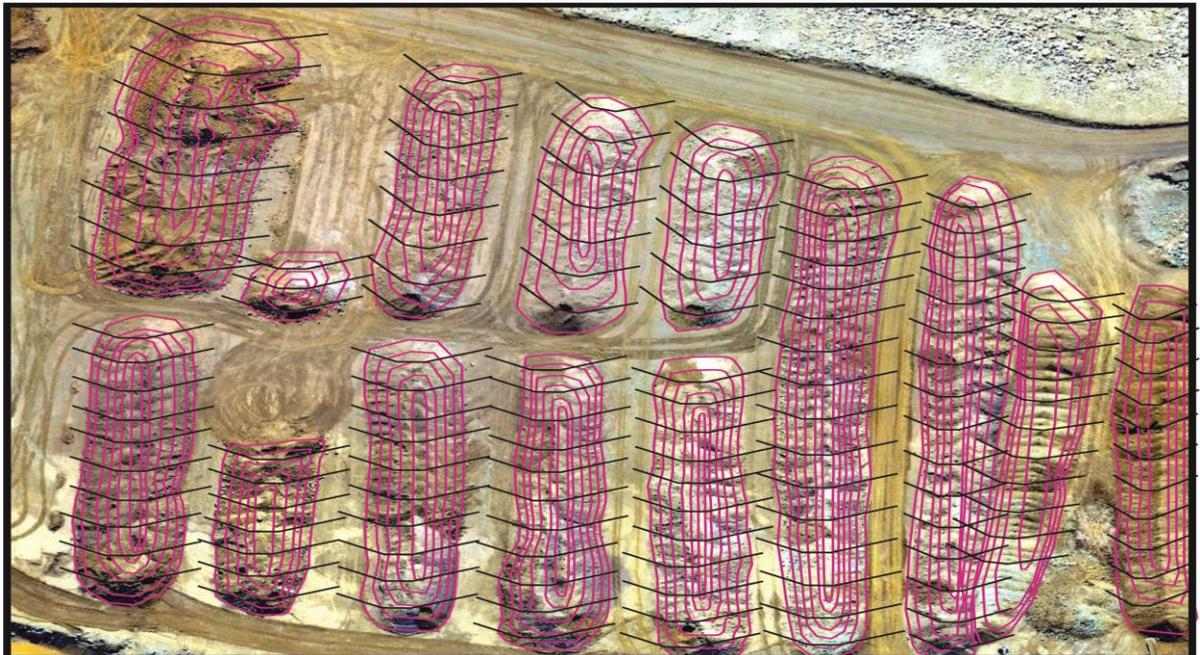


Fig. 1: Mines volume calculation