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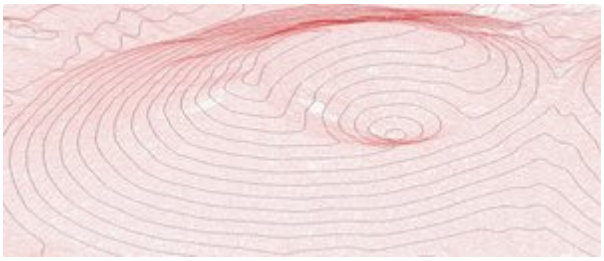
Sky high surveying

By Cole Latimer on 12 July 2010



Surveying stockpiles is a time consuming task.

While lasers have significantly reduced the amount of time it takes, between two workers the task can still take more than several hours.

In a leap forward, an Australian company has developed mine analysis and survey software that can be used with an unmanned aerial vehicle (UAV) to drastically cut time spent surveying stockpiles while increasing accuracy.

Adam Technology has created the 3DM analyst software which has been used successfully in Australia to survey stockpiles.

UAVs with digital SLR cameras attached were programmed via GPS to fly autonomously on a set path over mining stockpiles.
The UAVs, which are typically helicopters, can cover an area of 25 hectares within half an hour, providing a ground pixel size of under 4cm as well as a height accuracy of under 4cm.

The images are then collected and fed into the 3DM Analyst Mine Mapping Suite, which was specifically designed for use with digital cameras, and typically allows for accurate stockpile volume calculation of less than two hours.

This process provides advantages over traditional laser measurement methods as the entire surface of the stockpile is visible, with stockpile variances such as inverted cones being clearly defined.

It also results in a uniform point density as well as point accuracy across the entire surface due to the camera remaining the same distance from the stockpile during surveying, whereas terrestrial photogrammetry results in higher densities near the camera setup point but lower densities the further from the camera.

However, despite the ability to obtain accurate results within 20mm, the UAV surveying process also picks up points on infrastructure such as conveyor belts and stackers, which obscured the stockpile below and created gaps.

This is overcome by multiple flight runs, where the obscured areas are effectively changed, allowing the 3DM program to obtain a complete view of the surface by processing more images.

In addition to digital SLR cameras, the UAVs can also be equipped with video cameras for live feeds as well as IR cameras for surveillance.