
Title: Mine Rehabilitation Assessment Through Machine Learning in Pleiades Images

Monitoring using remote sensing techniques is increasingly playing a role in the assessment of mine-site rehabilitation. In the past, the major impediment to the uptake of technology has been the lack of resolution and inaccurate image understanding techniques. Recent advances in sensor technology and the rise of Artificial Intelligence (AI) have opened up new possibilities for mining industry.

Mapizy was engaged to assess the suitability of various remote sensing technologies for open-pit mine site rehabilitation with a focus on plant lifeform recognition. High resolution aerial images and LiDAR were used to identify plant lifeform, their spatial extent and biomass and the result was independently verified through ground observation. The plant lifeform composition is shown in Figure 1.

In another experiment, high resolution Pleiades satellite images provided by AIRBUS were used to produce the same metrics over a large area of 23 km² at a fraction of the cost of aerial and LiDAR. The plant category recognition result using satellite images is shown in Figure 2 and the classified image is shown in Figure 3. Looking at Figure 1 and 2, there is a good correlation between the both results except for shrub-tall mainly due to lack of sufficient training samples which can be resolved once further training sample becomes available.

In conclusion, this experimental study showed that high resolution satellite images can be a valuable source of geospatial insight and analytics when ground-breaking deep learning technology is employed to process the images.

About Mapizy:

Mapizy is a UWA spin-out company focused on change detection through image data. We are a team of thinkers and doers who are passionate about solving real-world problems with technology. Our software solutions were recognised by the American and UK Society of Photogrammetry and Remote Sensing through technology awards.

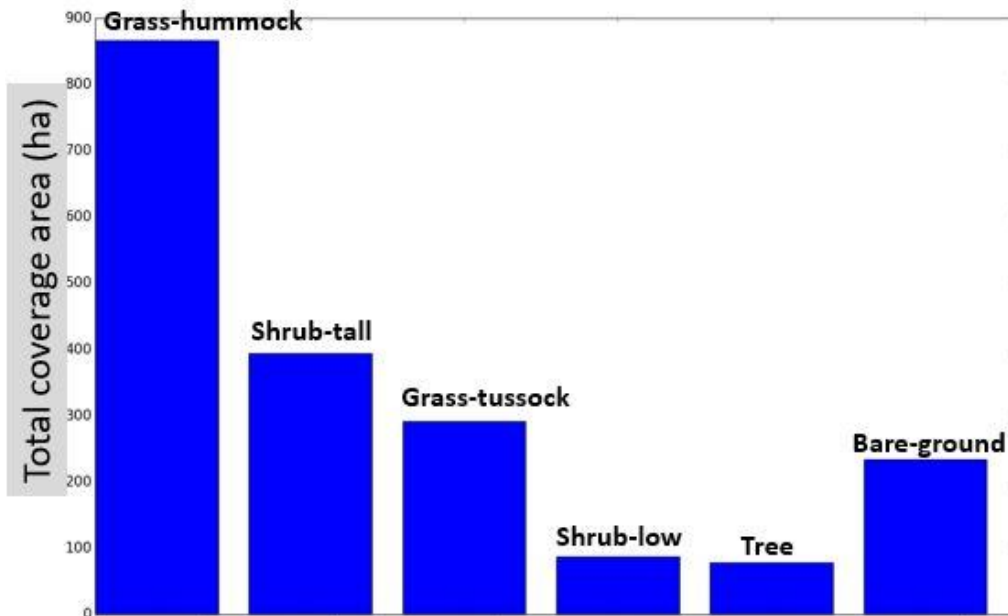


Figure 1 : Plant lifeform composition using aerial images and LiDAR

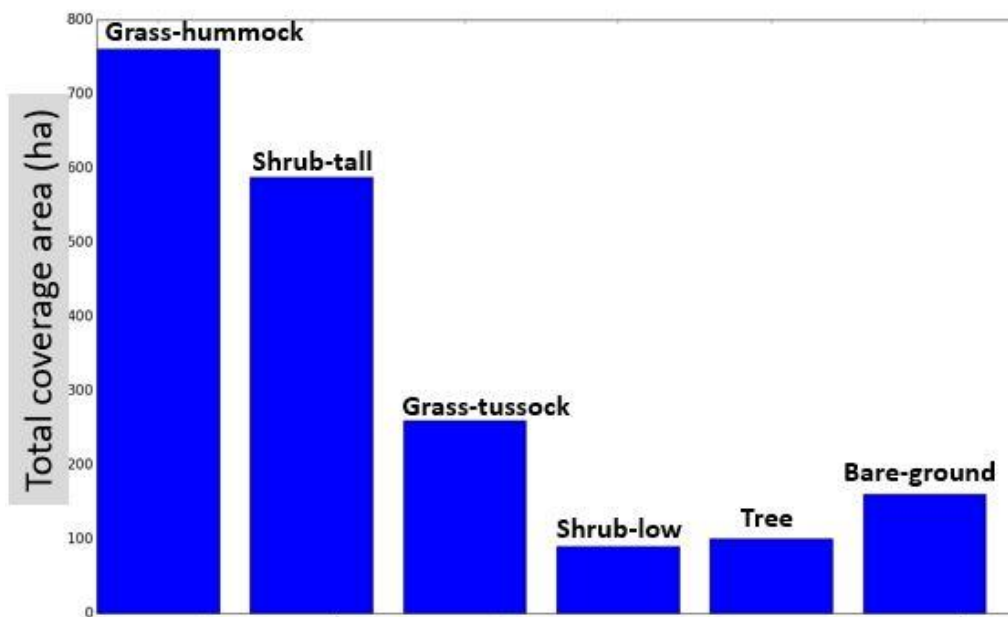


Figure 2 : Plant lifeform composition using satellite images

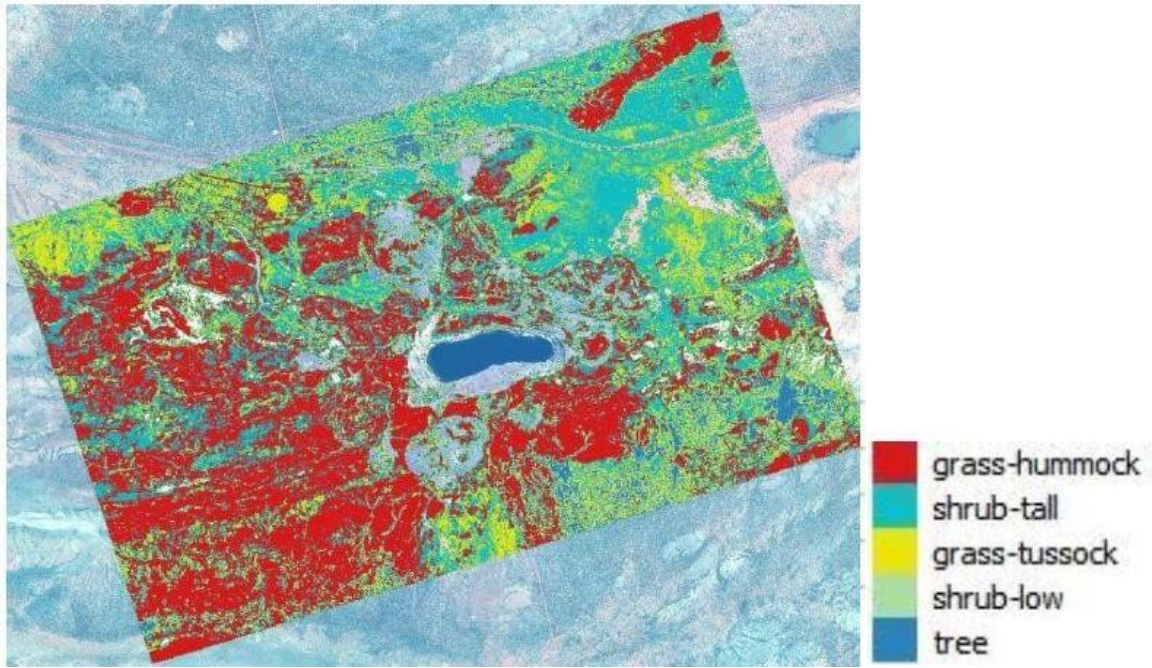


Figure 3 : Plant lifeform composition using satellite images