

# DSM Generation

## DSM Generation Using KOMPSAT-3A Stereo Data



Dr. Philip Cheng is a senior scientist working at PCI Geomatics.

PCI Geomatics, founded in 1982, is the world leader in geo-imaging products and solutions. PCI Geomatics has set the standard in remote sensing and image processing tools offering customized solutions to the geomatics community in over 135 countries.

PCI Geomatics is the developer of Geomatica® - a complete and integrated desktop software that features tools for remote sensing, digital photogrammetry, geospatial analysis, map production, mosaicking and more. Geomatica® software enables users to apply imagery in support of a wide range of applications such as the environment, agriculture, security and intelligence, defense, as well as in the oil and gas industries.

PCI Geomatics is also the developer of the GeoImaging Accelerator (GXL), an automated, high performance, Graphics Processor (GPU) system for processing terabytes of imagery data. PCI Geomatics is a privately held Canadian corporation headquartered in Toronto, Ontario.

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This study demonstrates how to use **KOMPSAT-3A** stereo data to extract digital surface models (DSM). The study area is the Bingham Canyon Mine in Utah, USA. The mine is the largest man-made excavation in the world and is considered to have produced more copper than any other mine in history.

Dr. Philip Cheng, a senior scientist at PCI Geomatics conducted this study with KOMPSAT-3A data and provided results to SI Imaging Services(SIIS).

SIIS provided a **level 10 single-pass stereo pair** of KOMPSAT-3A data acquired on Sept 25, 2019 with acquisition angles of +/- 24 degrees to PCI Geomatics. Level 10 is a processing level so-called ortho ready. It is the product corrected for geometric distortions and projected to UTM.

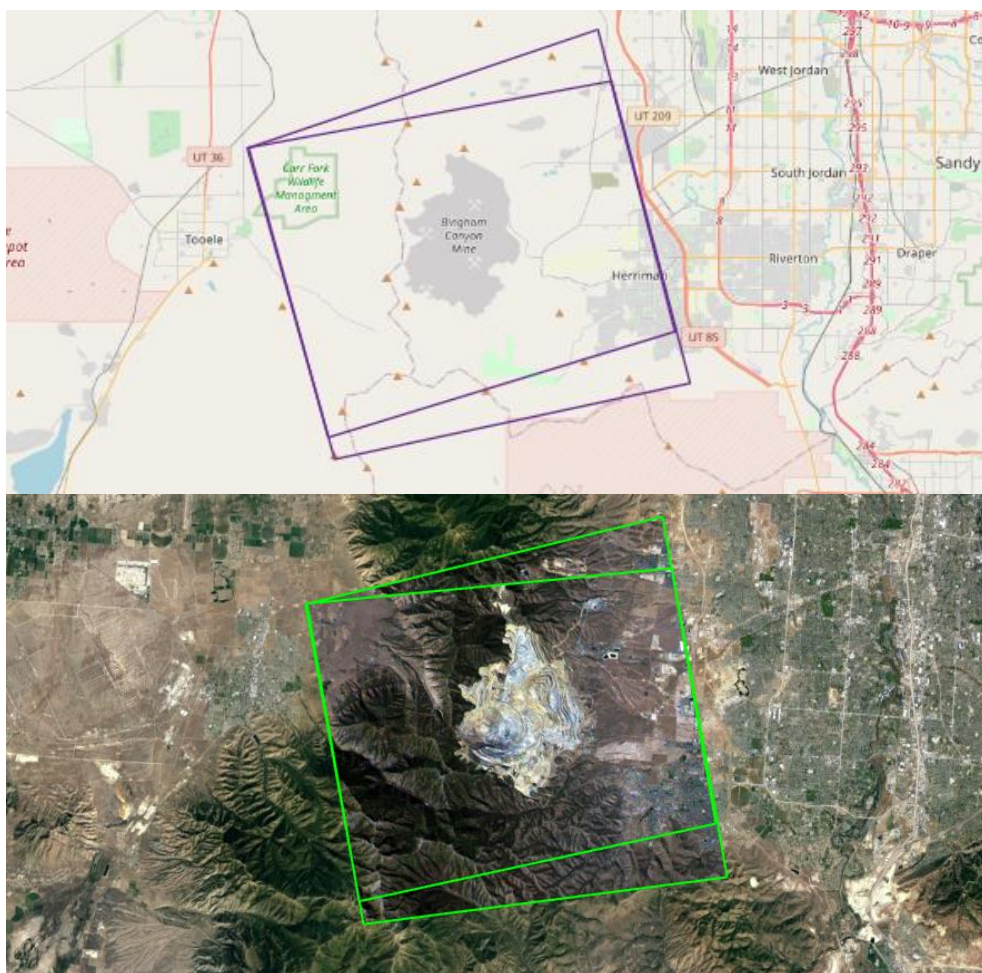


Figure 1. outline of KOMPSAT-3A stereo images acquired in 2019

**PCI OrthoEngine** software was used to perform all the processing, using the rational polynomial coefficients (RPC) geometric model option. Since ground control points (GCPs) were not available, only tie points (TPs) were collected, using **OrthoEngine's automated procedures**.



**PRODUCTS USED**

- KOMPSAT-3A
- 0.55m resolution
- EO satellite
- Single-pass stereo
- Level 10



Figure 2. KOMPSAT-3A pan-sharpened orthorectified imagery

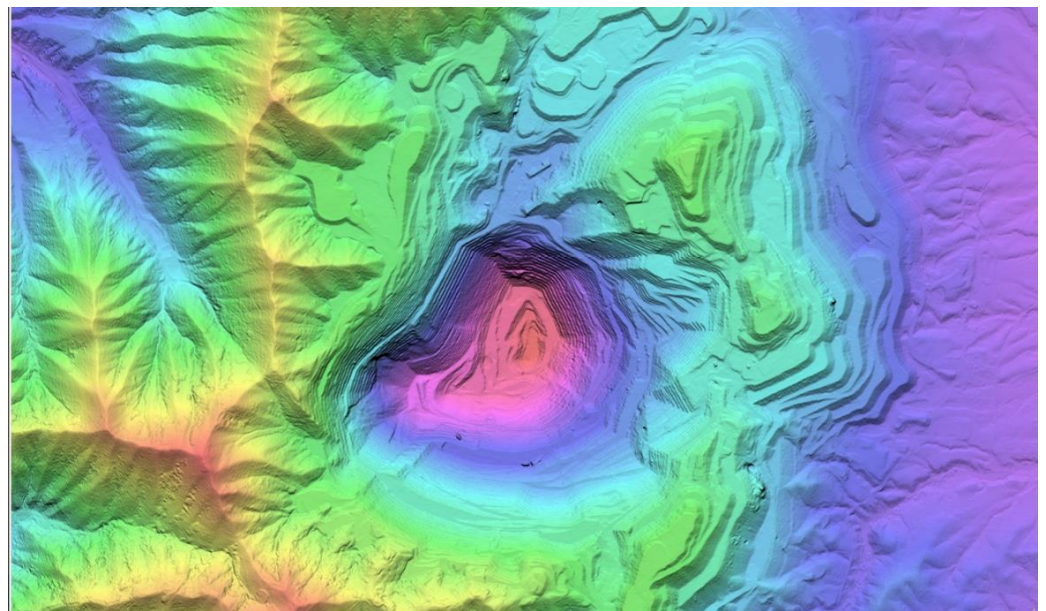


Figure 3. DSM extracted using KOMPSAT-3A imagery

## Conclusion

This study shows that KOMPSAT-3A stereo images are suitable for extracting DSMs. As a result, with the resolution of 1m, extracted DSM over the Bingham Canyon Mine shows the depth and height in different colors very well. Additionally, level 10 data was better to extract DSM when using RPC method. KOMPSAT-3A stereo images also seem to be useful for other applications such as mapping, disaster, and urban monitoring.

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