OrthoEngine ALOS Module

ALOS (Advanced Land Observing Satellite)

The OrthoEngine ALOS Module supports data correction for the three ALOS sensors: PRISM, AVNIR-2, and PALSAR.

Rigorous models are developed to compensate for distortions and produce orthorectified satellite images. Distortions caused by the platform (position, velocity, and orientation), the sensor (orientation, integration time, and field of view), the Earth (geoid, ellipsoid, and relief), and the cartographic projection (ellipsoid and cartographic) are all taken into account using these models.

ALOS imagery derived from the different sensors is used in disaster monitoring, landcover analysis, cartographic mapping and much more.

PRISM - The Panchromatic Remote-sensing Instrument for Stereo Mapping (PRISM) offers panchromatic 2.5m spatial resolution and stereoscopic imagery for digital elevation extraction.

AVNIR-2 - The Advanced Visible and Near Infrared Radiometer type 2 (AVNIR-2) sensor supports 10 meter spatial resolution in the multi-spectral and near infrared bands.

PALSAR - The Phased Array type L-band Synthetic Aperture Radar (PALSAR) supports 10 meter spatial resolution in "fine beam" mode. In ScanSAR mode, the spatial resolution is 100 meters in both azimuth and range directions.

MODULE PREREQUISITIES

The ALOS module is an add-on to Geomatica Core.

FORMAT SUPPORT

PRISM – JAXA Format for Level 1A, 1B1 and 1B2R format

AVNIR-2 – JAXA Format for Level 1A, 1B1, and 1B2R format

PALSAR – ERSDAC format for Image level 1.5, 1.5 long version, 4.1, and 4.2 format.
- JAXA Level 1.5 PALSAR data products

RIGOROUS MATH MODELS

Rigorous math models:
- Calculate the position and orientation of the sensor when an image is taken
- Accurately account for known distortions in an image
- Use GCPs and tie points, combined with the knowledge of rigorous geometry of sensors, to calculate the best fit for all images in a project

RPC MODELS FOR ALOS PRISM

The Rational Function is a simple math model that:
- Builds a correlation between the pixels and their ground locations
- Obtains RPC data with images and imports coefficients automatically
- Calculates the polynomial coefficients from GCPs
- Refine RPC data with one or more GCPs
- Zero- or first-order GCP refinement available

Ground Control Collection

GCP Collection

GCPs can be collected manually or by using:
- A geocoded image
- Geocoded vectors
- A chip database
- A digitizing tablet

- An imported text file

Other features include:
- Stereo-GCP collection
- Conversion of GCPs to check points to exclude from model calculation
- Display of individual and overall RMS error for GCPs

Tie-Point Collection

Tie points:
- Extend ground control over areas without GCPs
- Identify how the images in a project relate to each other
- Ensure the best fit for all the images in a project
- Let you enter tie-point elevations manually or extract them from a DEM
- Let you import and export tie points
- Show individual and overall RMS error for tie points

Residual Report

Using residual reports, you can:
- Show GCP, check-point, tie-point, and Stereo-GCP error information in one report
- Edit points in a residual report and update bundle adjustment
- View in ground units or pixel units
- Print the report to a file

Overall Layout

The OrthoEngine High-Resolution Models offer a quality-control tool that displays image footprints, distribution of GCPs, and tie points for your project

ORTHORECTIFICATION

Orthorectification:
- Lets you perform batch processes
- Utilizes a DEM for terrain correction
- Increases working cache for processing
- Increases sampling interval for faster processing
- Offers the following resampling methods:
  - Nearest Neighbor
  - Bilinear Interpolation
  - Cubic Convolution
  - 8-pt SinX/X
  - 16-pt Sin X/X
  - Average filter
  - Median filter
  - Gaussian filter
  - User-defined filter
- Clips image size upon orthorectification
- Lets you set a processing start time

MOSAICKING

With manual mosaicking, you can:
- Define a mosaic area
- Collect cutlines manually by:
  - Importing and exporting cutlines
  - Blending seams using Blend Width
- Perform manual color balancing:
  - Based on samples identified in overlap between images
  - By using samples (match areas) to compute look-up tables (LUTs) to adjust new images to match an existing mosaic
  - By adjusting the dark end or light end
  - By importing and exporting LUTs for color balancing
- Mosaic unreferenced images

ALGORITHMS INCLUDED

Read directly from the distribution CD the PRISM and AVNIR-2 data with the CDALOS task and the PALSAR data with the CDSAR task

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