OrthoEngine TerraSAR-X Module

TERRASAR-X

The OrthoEngine TerraSAR-X Module supports TerraSAR-X data for correction. Please note that the TerraSAR-X Module supports Dual Polarized TerraSAR-X data only.

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.

TerraSAR-X is an X band polarimetric SAR capable of imaging at up to 1m resolution. TerrSAR-X can be used for a wide variety of applications including visual interpretation, mapping, DEM creation, and disaster monitoring.

MODULE PREREQUISITIES

The TerraSAR-X module is an add-on to Geomatica Core.

FORMAT SUPPORT

TerraSAR-X For image correction in OrthoEngine:

- Multi-look ground range detected (MGD)
- Support for Dual Polarized Mode TerraSAR-X data only

GDB Support for reading the following formats varieties is also supported:

- Multi-look geocoded ellipsoid corrected (GEC)
- Multi-Look enhanced ellipsoid corrected (EEC)
- Single-look slant-range complex (SSC)

Each of the above formats have one or more of the following atenna mode variations

- StripMap Mode (SM)
- High-resolution SpotLight Mode (HS)
- Spotlight Mode (SL)
- ScanSAR Mode (SC)

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

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

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