



C R E A S O

T E C H N I C A L I N F O R M A T I O N

ENVI 4.7

OPERATING SYSTEMS

- Windows XP, Vista (32-bit & 64-bit)
- Linux kernel 2.6.x (32-bit & 64-bit)
- MacOS X 10.4, 10.5, PowerPC & Intel (32-bit)
- MacOS X 10.5 Intel (64-bit)
- Sun Solaris 10 (32-bit & 64-bit)

DATA INPUT

- ADS
- ASAR Data
- AATSR Data
- ALOS Data: PRISM / PRISM RPC, AVNIR-2, PALSAR
- ArcGIS Layer File (.lyr)
- ArcGIS® File Geodatabase
- ArcGIS® Personal Geodatabase
- ArcGIS® Enterprise (SDE) Geodatabase
- ASTER Data
- ATSR Data
- AVHRR Data
- AVIRIS Data
- CARTOSAT-1 Data
- DMSP Data
- ECW Format
- Elevation Data: USGS DEM, USGS SDTS DEM, DTED, FORMOSAT-2, GEOTIFF & RPC, SRTM
- ENVISAT level 1b and 2: AATSR, ASAR, MERIS
- EOS Data (HDF-EOS format): ASTER, MISR, MODIS
- EROS A level 1a and 1b Data
- ESRI GRID Format
- ESRI Layers
- FORMOSAT-2
- Generic Image Formats: ASCII (x,y,z columns, grids), BMP, ECW, Flat binary files, GeoJ2K, HDF, HDF-EOS, JPEG, JPEG2000, MrSID, PDS, PICT, PNG, SRF, TIFF, GeoTIFF, XWD
- GeoEye-1: GeoTIFF/RPC, NITF/RPC

- Gzip Compressed Files
- Hymap Data
- Image Processing Software Formats: ArcView (.bil), ECW, ENVI (raster and classification), ERDAS (.lan, .img, .ige), ER Mapper, MrSID (up to and including 3.0), RemoteView RSET (with NITF license), PCI (.pix)
- IRS Data in EOSAT Fast Format & Superstructural
- JPEG 2000 Format
- KOMPSAT - 2
- Landsat MSS, TM, ETM Data: EOSAT FAST, GeoTIFF, GeoTIFF with Metadata, HDF, NLAPS, ACRES CCRS, MRLS, ESA CEOS
- LAS Lidar Format
- Military Formats: NITF 2.0 & 2.1 (with license), NSIF 1.0, ADRG, CADRG, CIB, TFRD
- MERIS Data
- MIVIS Data
- MODIS Data
- MODIS Simulator (MAS-50 HDF) Data
- MrSID Format
- OrbView: GeoTIFF / RPC, NITF / RPC, Mosaic Tiled
- QuickBird: GeoTIFF / RPC, NITF / RPC, Mosaic Tiled
- Radar Data: RADARSAT, ENVISAT-ASAR, PALSAR, AIRSAR, SIR-C/X-SAR, TOPSAR, ERS, JERS
- SeaWiFS (OrbView-2) Data: CEOS, HDF
- RapidEYE: GeoTIFF, NITF
- SPOT Data: SPOT 5 (DIMAP) and level 1 metadata, 1A, 1B, 2A, CAP, ACRES, HDF Vegetation, GeoSPOT
- Thermal Data: TIMS, MASTER (MODIS/ASTER Simulator), ASTER, AATSR
- User-Definable Data Formats
- USGS DOQ Files
- Vector Formats: ARC Interchange Format (Uncompressed), ESRI Shape (.shp) with attributes, ENVI (.evf), AutoCAD DXF, USGS DLG, USGS SDTS, MapInfo, Microstation .DGN
- WorldView-1 Data: GeoTIFF / RPC, NITF / RPC, Mosaic Tiled



OUTPUT FORMATS

- ArcView Geodatabase
- Microsoft PowerPoint
- PDF
- Encapsulated Postscript (EPS)
- GoogleEarth: KML Creation, Footprints, Image Overlay
- Raster Formats: ArcView (.bil), ASCII, BMP, ENVI, ERDAS (.lan, .img), ER Mapper (.ers), ESRI GRID, GeoTIFF, Gzip Compressed, HDF, JPEG, NITF 1.1, 2.0, 2.1 (with license), PCI (.pix), PICT, PNG, SRF, TIFF, XWD
- Vector Formats: ESRI Shapefiles (with attributes), DXF, ENVI Vector Format
- Chip from Display to: File, PowerPoint, Print, ArcMap
- Direct Output to Printer
- MPEG
- PostScript
- VRML
- Output to Tape
- Export To: PDF, EMF, AI, EPS, SRG, BMP, JPEG, PNG, TIFF, GIF

DISPLAY FUNCTIONS

- Chip to: File, PowerPoint, Print, ArcMap
- Drag/Drop from: ArcGIS, File System, Windows Explorer, Data Manager
- Drag/Drop to the: Display, Process, Workflows
- GeoLink with ArcMap
- Color Mapping
- Color Tables: Pre-built Tables, Interactive Color Table Editor
- Cursor Query for Data/Screen Value, Elevation, Map Coordinates
- Dynamic Overlays (unlimited displays)
- Histogram Matching Between Displays
- Image Flickering and "Movies"
- Image Overlays: Annotation, Classification Results, Contour Lines, Density (gray level) Color Slicing, Grid Lines, Regions of Interest, Vector Layers
- Interactive 2-D Scatter Plotting
- Interactive Histograms & Stretching: Arbitrary Stretching, Auto Apply Stretches, Gaussian Stretching, Histogram Equalization Stretching, Histogram Matching Between Displays, Linear & Piecewise Linear Stretching, Square Root Stretching, Import/Export ASCII Look Up Tables, User-Defined Look Up Tables
- Interactive Pixel Editor
- Line-of-Sight (Viewshed) Analysis
- Link Unlimited Displays
- Measurement Tool
- Output Displays to PowerPoint: Create New Presentation, Append to Existing Presentation
- Output Displays to File or Printer
- Output Displays of Zoom Window
- Quick Filters: Sharpen, Smooth, Median

- Quick Color Infrared, True-Color Displays
- Save and/or Restore Display Group
- Select Display Bands from Spectral Plots
- Set Default Display Bands
- Spatial and Spectral Pixel Editing
- Spatial and Spectral Profiles
- Sub-Pixel Cursor Location
- Unlimited Number of Displays
- Virtual Mosaic
- Vector Overlays & GIS Capabilities

REGIONS OF INTEREST

- Buffer Zones Around ROIs
- Classification Images from ROIs
- Export ROIs to Vectors
- Input ROIs from ASCII
- Interactive, Easy-to-use ROI Definition: Draw Polygons, Polylines, Pixels, Draw ROIs with Interior Spaces (Donuts), ROIs from Intersection of Other ROIs, Multiple Objects Within One ROI, ROI Definition via Scatter Plots, Threshold Images to ROI, Merge ROIs, Import ROIs from Vectors
- Output ROIs to ASCII
- ROI Save & Restore
- Reconcile ROIs between Images via Map Coordinates
- ROI Growing Based on Statistics
- ROI Statistics

DATA PREPARATION

- Create New Standard or Virtual Image File from Existing Bands
- Generate Test Image
- Mask Generation From: Annotation, Image Data Values, ROIs, Intersection of ROIs, Vectors, NaN
- Mosaic Functions: Color Mosaic Preview, Cutline & Edge Feathering, Interactively Mosaic Multiple Bands or Files, Mosaic by Pixel (Line, Sample) or Map Coordinates, Automatic Color Balancing, Standard Image or Virtual Mosaic Output
- Define Spatial Subset by: Drawing on Display, File & Map Coordinates, Region of Interest, Other Image Extent, Meta Scroll Extent
- NITF Metadata Browser
- Rotate/Flip Data
- Spatial and Spectral Subsets
- Storage Order (Interleave) Conversions: BSQ, BIL, BIP, New File or Replace Original
- Stretch Data
- Subsample Images

PRE-PROCESSING & CALIBRATION

- Apply Gain & Offset



C R E A S O

- Bad Band Identification
- Bad Line Replacement
- Bad Pixel Replacement
- Cross-Track Illumination Correction
- Dark Subtraction
- Destripe Data
- Empirical Line Calibration
- ERS and Radarsat data calibration
- Flat Field Calibration
- Ignore Pixel Value
- Internal Average Relative Reflectance Calibration
- Log Residuals
- MODIS Bowtie Correction
- Radiometric Calibrations: AVHRR, Landsat MSS, TM, ETM, QuickBird, TIMS
- Sea Surface Temperature from AVHRR
- Thermal Atmospheric Correction

REGISTRATION & RECTIFICATION

- Associate DEM with Image
- Automatic Georeferencing of ASTER, AVHRR, AATSR, ASAR, MERIS, MODIS, Radarsat, SeaWiFS, SPOT
- Subpixel Ground Control Point Locations
- Georectify SPOT Using Information From Leader File
- Ground Control Points Prediction
- Image-to-Map Registration
- Image-to-Image Registration
- Interactive Ground Control Point Collection
- Import Ground Control Points from File
- Orthorectification: Aerial Photographs (Digital and Frame), ASTER, CARTOSAT-1, Generic RPC, Generic Pushbroom Sensors, IKONOS, OrbView-3, GeoEye-1, WorldView, FORMOSAT-2, Kompsat-2, QuickBird, SPOT 1-5
- Radial Resampling
- Rational Polynomial Coefficients (RPCs) Support
- Replacement Sensor Model (RSM)
- Real-time GPS Link
- Rotated Projections
- Save Transformation Matrix to ASCII
- Warp Resampling Methods: Bilinear, Cubic Convolution, Nearest Neighbor
- Warping Methods: Delaunay Triangulation, Polynomial, Rotation, Scaling, Translation (RST)

MAP PROJECTION SUPPORT

- Convert Coordinates Among Projections
- Contours From Any Registered Image
- Convert Map Projection
- Datum Support (>100)
- Dozens of Prebuilt Map Projections, Examples Include: Universal Transverse Mercator (UTM), State Plane, Gauss-

- Krüger, Map Grid of Australia, Mississippi Standard Transverse Mercator
- Ellipsoid Support (>35)
- French RGF projection
- Pseudo-Projections from RPCs and RSM
- User-Defined Map Projections
- User-Defined Projection Units
- USGS GCTP Map Projections, Examples Include: Albers Conical Equal Area, Azimuthal Equal Area, Lambert Conformal Conic, Space Oblique Mercator (A & B), Stereographic, Transverse Mercator

VECTOR GIS FUNCTIONS

- Drag/Drop ArcGIS Layers
- ArcGIS Layer Attribute Viewing
- Add Nodes to Vectors
- Annotate Vector Windows
- Attributes: Create New Vector Attributes, Edit & Query Vector Attributes, Import from ArcView Shapefiles & ASCII, Query to Create New Vector Layer
- Burn-in Vectors on Raster Image
- Convert Vector Layer Projection
- Create Contour Vectors from Raster Data
- Create New Vector Layers
- Create Vector Boundaries: Countries, States, Coasts, Rivers, For Whole World, For Lat/Long Boundaries
- Direct Printing of GIS Layers
- Display Vectors with Different Projections in the Same Window
- Drag/Drop to Arrange Layer Order
- Edit Layer Characteristics
- Export Vector Data to Common GIS Formats
- Export Vector Attributes
- GPS Input
- Heads-up (On-screen) Digitizing
- Intelligent Digitizer
- Import Common GIS Formats: ESRI Shapefiles, Arc Interchange, AutoCAD DXF, MapInfo, Microstation DGN, USGS DLG, USGS SDTS, ENVI Native Vector Format
- Import from ArcGIS GeoDatabase
- Interactive Vector Layer Querying
- Join Vectors
- Multiple Vector Selection
- On-the-fly Vector Projection Conversion
- Raster to Vector Conversions
- Save Vectors to ArcGIS GeoDatabase
- Split Vectors
- Vector Cursor Query
- Vector Display Zooming
- Vector Editing
- Vector to Raster Conversion



C R E A S O

SPECTRAL ANALYSIS TOOLS

- Adaptive Coherence Estimator (ACE)
- Anomaly Detection
- Automated Corner Clustering in N-Dim Scatter Plot
- BandMax Band Optimization
- Constrained Energy Mimimization (CEM)
- Continuum Removal of Images, Spectra
- Decision Tree Classifier
- Extraction of Endmember Spectra
- Integrated Spectral Viewing & Analysis
- Linear Spectral Unmixing
- Least Squares (LS) Fit
- Matched Filtering
- Mixture Tuned Matched Filtering
- Mixture Tuned Target - Constrained Interference - Minimized Filter (MTCIMF)
- N-Dimensional Visualizer (Scatter Plot)
- Orthogonal Subspace Projection (OSP)
- Pixel Editing
- Pixel Purity Index (PPI)
- SAM Target Finder With BandMax
- SMACC Endmember Extraction & Sub-pixel Analysis
- SPEAR Tools: Change Detection Two Color Multi-View, Change Detection - PCA, Change Detection - Subtractive, Pan-Sharpening, Lines of Communication - Water, Lines of Communication - Roads, Watercraft Finder, Relative Water Depth, Vegetation Delineation and Stress Detection, Spectral Analogues, TERCAT (Terrain Categorizations)
- Spectral Resampling: Predefined Sensor Band Filters, User Defined Filters, Spectral Libraries and Images
- Spectral Analyst for Material Identification
- Spectral Angle Mapper (SAM)
- Spectral Feature Fitting (SFF)
- Spectral Hourglass Wizard
- Spectral Information Divergence
- Spectral Libraries Included: Manmade, Minerals, Rocks, Snow, Soils, Vegetation, Water, VNIR, SWIR, MWIR, LWIR
- Spectral Library Builder/Importer
- Spectral Library Viewer
- Spectral Math
- Spectral Plots: Boxcar Average of Pixel Spectra, Continuum Removal, Cursor Query of (X,Y) Plot Values, Drag and Drop Spectra Among Plot Windows, From 3D SurfaceView, From Image Pixels (Z Profile), From Spectral Libraries, From ROI Averages, Link Spectral Plots from Multiple Images, Plot Stacked Spectra, User-Defined Plot Functions, Wavenumber or Wavelength
- Subspace Background Suppression
- Spectral Slices
- Target-Constrained Interference-Minimized Filter (TCIMF)
- Target Detection Wizard
- Vegetation Guided Workflows: Fire Fuel Load, Agricultural

Stress, Forest Health

- Vegetation Indices: Greenness, Light-use Efficiency, Canopy Nitrogen, Senescent Carbon, Canopy Water, Leaf Pigment
- Vegetation Suppression Algorithm

SPEAR TOOLS

- Anomaly Detection
- Change Detection - 2 Color Multi-view (2CMV)
- Change Detection - PCA
- Change Detection - Subtractive
- Google Earth Bridge
- Image-to-Map Registration
- Independent Component Analysis
- LOC - Lines of Communication - Roads
- LOC - Lines of Communication - Water
- Metadata Browser
- Orthorectification
- Pan Sharpening
- Relative Water Depth
- Spectral Analogues
- Terrain Categorization (TERCAT)
- Vegetation Delineation
- Vertical Stripe Removal
- Watercraft Finder

TRANSFORMS

- Adaptive Coherence Estimator (ACE)
- Band Ratios
- Color Transforms: RGB to HSV, HSL, or Munsell HSV; HSV, HSL, or Munsell HSV to RGB
- Decorrelation Stretch
- Independent Component Analysis
- Image Sharpening: Color Normalized Spectral, Gram-Schmidt Spectral, HSV and Brovey, PC Spectral, Preserving Spectral Integrity
- Minimum Noise Fraction (MNF)
- Normalized Difference Vegetation Index (NDVI)
- Pan Sharpening (see Image Sharpening)
- Principal Components Rotation
- Saturation Stretch
- Synthetic Color Image
- Tasseled Cap

FILTERS

- Adaptive Filters: Frost, Enhanced Frost Gamma, Kuan, Lee, Enhanced Lee, Local Sigma, Bit Error
- Convolution Filters: High & Low Pass, Laplacian, Directional, Gaussian, Median, Sobel, Roberts
- Filtering Preview
- Interactive Fourier Filtering: Forward Transform, Interactive Frequency Domain Masking, Inverse Transform
- Morphology Filters: Dilate, Erode, Opening, Closing



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- Texture Filters: Contrast, Correlation, Data Range, Dissimilarity, Entropy, Homogeneity, Mean, Skewness, Second Moment, Variance
- User-Defined Filter Kernels

MATHEMATICS & STATISTICS

- Autocorrelation
- Band Histograms
- Band Math and Spectral Math: Boolean Operators, Data Type Conversion Functions, Relational Operators, Trigonometric Functions, Many Other Mathematical Expressions
- Correlograms
- Display Statistics: Minimum, Maximum, Mean, Standard Deviation
- Image Statistics: Band Minimum, Maximum, Mean, Standard Deviation, Eigenvalues, Eigenvectors, Covariance & Correlation Matrices
- Output Matrix Stats to Image Files: Covariance Matrix, Correlation Matrix, Eigenvectors
- Semivariograms

IMAGE CLASSIFICATION

- Adaptive Coherence Estimator (ACE)
- Accuracy Assessment
- AIRSAR Scattering Mechanism Classifier
- Automatic Legends for Classified Images
- Change Detection - PCA
- Change Detection - 2CMV (2 Color Multi-view)
- Change Detection - Subtractive
- Change Detection, Thematic and Grayscale Images
- Classification Preview
- Class Statistics
- Classification Image from ROIs
- Constrained Energy Minimization (CEM)
- Decision Trees
- Density Slicing
- Interactive User-Defined Rule Classifier
- Independent Components Analysis
- Orthogonal Subspace Projection (OSP)
- Mixture Tuned Target-Constrained Interference-Minimized Filter (MTCIMF)
- Receiver Operating Characteristic (ROC) Curves: Find Optimal Classification Thresholds, Decrease False Classifications
- Separate Classification Thresholds for Each Class
- Supervised Classifications: Binary Encoding, Parallelepiped, Mahalanobis Distance, Minimum Distance, Maximum Likelihood, Neural Network, Spectral Angle Mapper (SAM), Spectral Information Divergence (SID), Support Vector Machine (SVM), TERCAT (Terrain Categorization)
- Target-Constrained Interference-Minimized Filter (TCIMF)

- Training Data From: Regions of Interest, Pixel Spectra, Library Spectra
- Unsupervised Classifications: Isodata, K-means
- Vegetation Guided Workflows: Fire Fuel Load, Agricultural Stress, Forest Health

POST CLASSIFICATION TOOLS

- Accuracy Assessment: Kappa Coefficient, Confusion Matrix
- Classification to Vector
- Class Statistics
- Interactive Class Overlay Tool
- Reassign Class Colors, Names
- Spatial Functions: Buffer Zones Around Classes, Clump, Sieve, Combine, Majority & Minority Analysis, Segmentation Image
- Stratified Random Point Generation

TOPOGRAPHIC ANALYSIS

- Associate DEM with Image
- Calculate Slope and Aspect Images
- Calculate Shaded Relief Image
- Create DEM From Vector Elevation Contours
- Hillshade (Shaded Relief Combined with RGB Image)
- Line-of-Sight (Viewshed) Analysis
- Rasterize Point Data
- Topographic Measures: Convexity, Plan Convexity, Longitudinal Convexity, Cross Sectional Convexity, Minimum Curvature, Maximum Curvature
- Three Dimensional Visualization
- Topographic Feature Extraction (Classification): Channel, Ridge, Peak, Pit, Plane

3 - D SURFACEVIEW

- Animated 360° Visualization
- Associate DEM With Image
- Change View Interactively Using Mouse
- Create Fly-Through Sequence: Interpolate Between User Selected Views, Follow Annotation Line
- Custom Background Color
- Drape Image Over 3-D Surface
- Output Fly-Through Sequence: MPEG, VRML 2.0
- Overlay Vectors, Regions Of Interest
- Set Vertical Exaggeration
- Smooth Image, DEM

ANNOTATION AND MAP COMPOSITION

- Map/Print Layout utilizing ArcGIS Templates
- Utilize ArcGIS Layout Templates
- Automatic Contour Labeling
- Automatic Legends for Classified Images, Scale Bars, and Color Ramps, Text, Points, Polylines, Polygons, Symbols



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- Burn-in or Overlay Annotations
- Cartographic Symbols
- Contour Lines from DEM, Other Images
- Counting Tool
- Create Reusable Map Templates
- Grid Lines: Pixel, Lat/Long &/or Map Grids
- Inset Images (e.g., Logos) or Vector Plots
- Interactive Map Composition Using Image Displays
- Interactively Reposition Annotation and Map Elements
- Interactive Plot Scaling
- Rotated Map Projections
- Save & Restore All Parameters
- TrueType® Fonts (Plus Add Your Own)
- User Definable Arrows & Declination Diagrams (True, Grid and Magnetic North)
- Vector Overlays

RADAR FUNCTIONALITY

- Adaptive (Speckle Reduction) Filters: Frost, Enhanced Frost, Gamma, Kuan, Lee, Enhanced Lee, Local Sigma, Bit Error
- Antenna Pattern Correction
- AIRSAR Scattering Mechanism Classifier
- CEOS Tape Reading
- Convert integrated TOPSAR to: Digital Elevation Model (DEM), C-band VV data, Incident Angle Image, Correlation image, L- and P-band polarimetric AIRSAR data
- Display and Analyze Radar Data Using Standard ENVI tools
- Edge Enhancement Filters
- Import ASAR, ERS, JERS, RADARSAT, AIRSAR, TOPSAR, SIR-C/X-SAR, ALOS
- Incident Angle Images
- Multi-Look SIR-C Data
- Pedestal Height Images
- Phase Difference Images
- Polarization Signatures from ROIs & Single Pixels
- RADARSAT-2 Endorsement
- Sigma nought and Beta nought from ERS, RADARSAT
- Slant-to-Ground Range Conversion
- Synthetic Color Image
- Synthesize Images from Compressed, Complex Scattering Matrix Data
- Texture Measures
- View CEOS Headers

GENERAL INTERFACE & OPERATION

- 8- and 24-Bit Color, Multiple Displays
- Access to IDL Functions*
- Add Custom Routines to Menu
- Batch Recording, Queuing, and Playback
- Build Scripts for Common Functions*
- Command Line Use of ENVI Functions*

- Context-Sensitive Mouse Descriptions
- Cursor Coordinates (Pixel & Map), Data Values & Elevations
- Direct Link to GPS Devices (Real-time Input)
- Edit ENVI Header Information
- Efficient Memory Management
- Extensive Preferences Settings
- Geo-Browser Image Selection from Graphical Index Map
- Logical Menu-Based GUI (Graphical User Interface)
- Multi-Processor Aware Algorithms
- Platform-Independent Operation
- Recursive Directory Scanning for Files
- Support for Files Greater than 2 GB
- User-Configurable Menus & Buttons

* Only available with ENVI+IDL

DOCUMENTATION

- Context-Sensitive Help
- Module Documentation
- On-line, Hyperlinked Documentation
- Programmer's Guide (with Examples)
- Training Manuals
- Tutorials & Sample Data
- User's Guide

ENVI ADD-ON PRODUCTS

SARSCAPE FOR ENVI

- Comprehensive set of SAR data processing modules, developed by sarmap s.a
- Basic Module: It includes a set of processing steps for the generation of SAR products based on intensity including a multi-purpose tool. This module is complemented by:
 - Focusing Module: It supports the focusing of RADARSAT-1, ENVISAT ASAR, and ALOS PALSAR raw data.
 - Gamma and Gaussian Filtering: It includes a whole family of SAR specific filters. They are particularly efficient to reduce speckle, while preserving the radar reflectivity, the textural properties and the spatial resolution, especially in strongly textured SAR images.
- Interferometry Module: It supports the processing of Interferometric SAR (2-pass interferometry, InSAR) for the generation of Digital Elevation Model and Coherence maps, as well as the processing of Differential Interferometric SAR data (n-pass interferometry, DInSAR) for the generation of Land Displacement/Deformation maps. This module is complemented by:
 - ScanSAR Interferometry: It offers the capabilities to process InSAR and DInSAR data over large areas (400 by 400 km).
 - SAR Polarimetry and Polarimetric Interferometry: It



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supports the processing of polarimetric and polarimetric interferometric SAR data.

- Persistent Scatterers Module: It enables to determine mm-scale displacements of individual features on the ground.
- Quality Assessment Tool: It includes a set of functions for the SAR data quality assessment in geometric, radiometric, and polarimetric terms.
- For further information please visit www.creaso.com/sarscape.htm

ENVI DEM EXTRACTION MODULE

- Extract DEMs from pushbroom stereo images that have Rational Polynomial Coefficients (RPCs)
- Supports RPCs from multiple pushbroom sensors: ASTER, IKONOS, OrbView-3, QuickBird, SPOT 1-5, etc.
- Extract DEMs using a wizard or menu items: select stereo images, select & edit GCPs, collect & edit tie points, generate epipolar images, set output DEM projection/size, select DEM extraction parameters, edit final DEM
- DEM Editing Tool: edit pixel values within a ROI
- Stereo Pair 3D measurement tool: Select a common point from two stereo images and calculate elevation value
- Epipolar 3D Cursor: 3D stereo measurements based on an existing epipolar stereo pair of images

ENVI ATMOSPHERIC CORRECTION MODULE

- Remove atmospheric interference from your imagery, using MODTRAN-based Fast Line-of-sight Atmospheric Analysis of Spectral Hypercubes (FLAASH) or Quick Atmospheric Correction (QUAC)

FLAASH Features:

- Corrects images for water vapor, oxygen, carbon dioxide, methane, ozone, molecular and aerosol scattering
- Based on MODTRAN4+ radiation transfer code. A unique MODTRAN4+ solution is computed for each image
- Produces useful auxiliary information (column water vapor image, cloud map, visibility value for the scene)
- User identifies Aerosol Model (rural, maritime, urban, etc.), Atmosphere Model (tropical, sub-arctic, summer, etc.), Image Details
- Supported Hyperspectral Sensors: AISA, AVIRIS, CASI, HYDICE, HYMAP, HYPERION, UNKNOWN-HSI
- Supported Multispectral Sensors: ASTER, AVHRR 7-17, IKONOS, IRS LISSII & LISSIII, Landsat TM 4,5, ETM 7, Landsat MSS 4,5, MODIS, SeaWiFS, SPOT 1,4,5, QuickBird, UNKNOWN-MSI

QUAC Features:

- Automated atmospheric correction of MSI and HSI data in the solar reflective spectral region (~0.4-2.5 μm)
- Support sensors: AISA, ASAS, AVIRIS, CAP ARCHER,

COMPASS, HYCAS, HYDICE, HyMap, Hyperion, IKONOS, Landsat TM, LASH, MASTER, MODIS, MTI, QuickBird, RGB, and unknown sensor types

- The input data can be in radiance, apparent reflectance, or raw/uncalibrated units
- The output is atmospherically corrected MSI or HSI reflectance data

ORTHORECTIFICATION MODULE

- Rigorous sensor models
- Multiple scenes
- Block bundle adjustment
- Automatic or manual cut-line generation
- Automatic color balancing
- Batch processing
- Auto tie point generation
- GCPs for model adjustment
- Automated error checking & QC
- Supported sensors: ASTER, IKONOS, LANDSAT 5 and 7, OrbView-3, QuickBird, SPOT 1-5 Level 1A or 1B, WorldView-1, GeoEye-1, CARTOSAT-1, RPCs, Customizable (easily add new sensors)

ENVI NITF MODULE

- Read Support Tested to Complexity Level 7 by JITC
- Read Support for NSDE Classified Tags and for Unclassified and User Defined Tags
- Write Support Tested to Complexity Level 7, including JPEG2000 Compression
- Read Support for NITF 1.1, 2.0 and 2.1
- Write Support for NITF 2.0 and 2.1 Files Containing Single Images, with no Text, Annotation, or Tag Segments
- Access to Read and Write of NITF Files within ENVI Menu Interface and via Batch Mode

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