



IMAGINE Advantage[®] PRODUCT DESCRIPTION

IMAGINE Advantage

Product Description

The mid-level tier of the ERDAS IMAGINE® suite, IMAGINE Advantage®, builds upon the geographic imaging capabilities of IMAGINE Essentials® to offer more advanced and precise mapping and image processing capabilities. IMAGINE Advantage gives GIS professionals, image analysts and photogrammetrists more analysis capabilities to make better, more informed decisions. IMAGINE Advantage can provide strategic value to a variety of industries including agriculture, forestry, natural resource management, telecommunications, environmental engineering and the extractive industries.

Please also review the IMAGINE Essentials Product Description for the capabilities and features available for all levels of the ERDAS IMAGINE suite.

Key Features

Orthorectification - IMAGINE Advantage extends the standard techniques available within IMAGINE Essentials to include sensor-based modeling and single-frame orthorectification.

- Sensor models for orthorectifying data
 - Standard frame cameras
 - Digital camera
 - ALOS PRISM
 - ALOS PRISM with RPC
 - ASTER Rigorous Orbital model
 - CARTOSAT RPC
 - DPPDB
 - EROS 1A & 1B
 - FORMOSAT2
 - Frame Camera
 - GEOEYE-1/OrbView-3
 - IKONOS NITF
 - IKONOS with RPCs
 - IRS-1C / 1D
 - Landsat TM, MSS, ETM+
 - MODIS
 - OrbView3 Rigorous Orbital model
 - OrbView3 RPC
 - QuickBird with RPC
 - QuickBird/WorldView (including NCDRD format)
 - RADARSAT
 - RESOURCESAT
 - SPOT 5 Rigorous Orbital model
 - SPOT Pan, XS, XI
 - WorldView RPC
- Orthorectification models for solving when ephemeris information is lacking
 - Direct Linear Transform (DLT)
 - Projective Transform
- Specify principal point and focal length for the camera
- Select fiducial layout type and record film location template
- Measure fiducial image locations
- Specify/calculate rotation angles for Omega, Phi, Kappa
- Specify/calculate perspective center position for X, Y, Z
- Account for the Earth's curvature

- User-specified number of iterations
- Specify output projection system
- Select GCP reference coordinates from map, image, vector or keyboard
- Standard GCP editor extended to allow the definition of Z values
- Raster Product Format (RPF) production
 - Controlled Image Base (CIB)
 - Compressed Arc Digital Raster Graphics (CADRG)

Metric Accuracy Assessment (MAA) tool - When delivering products derived from imagery, users should always be able to state the spatial accuracy of those products. The MAA tool provides the means of calculating the accuracy of mono or stereo pair imagery (which has a 3D geometry model) using photo-identifiable ground control points.

- Control (or Test & Evaluation – T&E) points can be manually entered or read from file
- Calculation of error statistics
- Individual point error and statistics report
- Error computations are based on MIL-STD-60001, with bias taken into account
- CE is computed using horizontal error as input to the LE formula with bias

Surface Interpolation - A surface tool provides an effective means of interpolating a continuous raster surface from discrete input data.

- Process more than 50,000,000 points
- Multiple input data sources supported
- Interpolation techniques: linear or non-linear rubber sheeting (Delaunay Triangulation)
- User-definable output

Mosaicking - IMAGINE Advantage provides a graphical mosaicking tool for seamlessly merging pairs or blocks of images. The Mosaic Tool now provides improved color balancing and matching capabilities to produce seamless mosaics.

- Command line interface for production batch processing
- Mosaic Wizard for easy learning
- Mosaic Direct for rapid setup times
- Mosaic Tool for control over all aspects of the mosaic process
- Stitch multiple images with:
 - Differing or like resolution (pixel sizes)
 - Differing or like projection systems
 - Geometrically calibrated images
- Select the images to mosaic individually, by all the files in the directory or by all the files in a file list
- Load images directly from a Leica Photogrammetry Suite Blockfile
- Control the image area considered for mosaicking
 - Use the entire image
 - Compute an active area
 - Use a template AOI
 - Use an individual AOI
 - Crop edges by percentages
- Use relatively positioned images or images with just map information in addition to fully georeferenced images
- Color balancing
 - Manual or semi-automated
 - Define abnormal areas for exclusion from processing
 - Surface-fitting removes spatially varying illumination effects such as hot spots
 - Preview color balancing effects
- Dodging
 - User definable grid size
 - Band dependant or independent
 - Dodge across images or individually
 - Manually editable correction settings
 - Preview

- Histogram matching based on
 - Image to image
 - Overlap areas only
 - Ideal target histogram
- Use existing lookup tables (LUTs) to perform color balancing
- View image outlines, overlap areas and cutlines
- Full control over the algorithm applied at each image overlap region
- For overlap areas, cutlines can be defined automatically or by the user
 - Save to/Load from Shapefile
 - Automatic Geometry based cutlines
 - Automatic Weighted cutlines
- Additional cutline options for triangulated data
 - Most Nadir
 - Most Nadir Narrow
 - Most Nadir by DTM
- Seam smoothing/blurring
- Output a single file or cut into project files
 - Union of all inputs to single file
 - User-defined AOI to single file
 - Multiple AOIs to separate files
 - Use Map Series file to output to multiple files on user defined grid pattern
 - ASCII sheet file definition
 - Rotated output sheets
 - Global Clip Boundary
- Specify output projection cell size and data type

Image Processing & Spatial Analysis - IMAGINE Advantage provides access to over 100 standard image processing and GIS techniques for enhancing and analyzing data.

- Spatial enhancement
 - Convolution filter
 - Non-directional edge detection
 - Focal (neighborhood) analysis
 - Texture
 - Wallis adaptive filter
 - Statistical filter
 - Resolution merge
 - Wavelet Resolution Merge
 - Modified IHS Resolution Merge
 - Tailored to be sensor-specific
 - Maintains spectral radiometry
 - Merge multiple bands, not just three
 - High Pass Filter (HPF) Resolution Merge
 - Trade color for sharpness or vice versa
 - 2-pass process for high spatial disparity images
 - Subtractive Resolution Merge
 - Ehlers Fusion
 - Wavelet based pan sharpening
 - Automatic or manual filtering schemes
 - Crisp
- Radiometric enhancement
 - Look-Up Table stretch
 - Histogram equalization
 - Histogram match
 - Image inversion
 - Haze reduction
 - Noise reduction

- Destripe Landsat
- Spectral enhancement
 - Principal components
 - Inverse principal components
 - Decorrelation stretch
 - Tasseled cap transformation
 - Color transformations
 - RGB to IHS
 - IHS to RGB
 - Sensor-specific indices
 - Natural color simulation
 - Landsat 7 Reflectance and Radiance conversion
 - Spectral Mixer
- Hyperspectral tools
 - Normalize spectrum
 - Internal Average Relative Reflectance (IARR)
 - Log residuals
 - Rescale
 - Spectrum
 - Signal-to-noise ratio
 - Mean per pixel
 - Profile tools
- Fourier analysis
 - Fourier transform
 - Graphical fourier transform editor
 - Inverse fourier transform
 - Fourier magnitude
 - Periodic noise removal
 - Homomorphic filter
- Topographic analysis
 - Viewshed tool
 - Slope angle
 - Aspect facing
 - Level slice
 - Shaded relief
 - Painted relief
 - Topographic normalize (Lambertian reflection model)
 - Raster contour
 - Surface interpolation
 - Painted relief
 - Anaglyph image generator
 - DEM height converter
- GIS analysis (many applicable for vector as well as raster)
 - Neighborhood functions
 - Clump, sieve and eliminate classes
 - Perimeter of clumps
 - Search (buffer)
 - Index (weighted summation)
 - Overlay (minimum or maximum)
 - Matrix (overlap)
 - Recode
 - Summary (cross tabulation statistics)
 - Zonal attributes (parcel statistics)
- Utilities
 - Mathematical functions
 - Automated change detection
 - Operators (image algebra)

- RGB clustering classification
- Layer stack
- Subset
- Create empty file
- Rescale
- Mask
- Degrade
- Replace bad lines
- Vector to raster
- GIS Aggregation (Aggie)
- Thematic to RGB
- Morphological operators
 - Open
 - Close
 - Erode
 - Dilate
- Image dicer/tiler
- Generic options
 - Restrict function to Area of Interest (AOI) or rectangular subset
 - Stretch to 8-bit data range
 - Ignore zero values in output statistics
 - Schedule for batch processing
 - RLE compress outputs

Modeling Language - The Spatial Modeling Language (SML) is highly flexible, enabling users to create and run customized models for image processing and GIS analysis. The Spatial Modeler fully supports the input of calibrated imagery and will output it to a specified projection system. The majority of Image Interpreter functions, which use the underlying Spatial Modeler programs, now also support multiple input projection systems and calibrated imagery.

- Model librarian with built-in editor
- Over 80 example SML scripts to customize
- Specify the projection system when inputting two or more images of differing projections into a model
- Function types (over 200 provided)
 - Point
 - Neighborhood (focal)
 - Global
 - Zonal
 - Layer
- Statements
 - Declarations
 - Assignments
 - Show, read and write
 - Set
 - Macro definitions
 - Quit
 - Flow control
 - Statement blocks
- Object types
 - Scalar
 - Table
 - Matrix
 - Raster
 - Vector
- Data types
 - Binary
 - Integer
 - Float

- Complex
- Color
- String
- Variables
- Windows
- Syntax error checking
- Calibration and reprojection support

Knowledge Classifier - Using knowledge bases created with IMAGINE Professional®, IMAGINE Advantage users can classify geographic data with the simple, user-friendly Knowledge Classifier wizard interface.

- Evaluate classification classes
- Automatically identify missing files
- Output fuzzy sets, confidence layers and feedback layers, as well as classifications

Knowledge bases created by expert users in IMAGINE Professional can be distributed to IMAGINE Advantage users anywhere in the world to apply classification processes to their data. This portability is one of the keys to the strength of the expert systems approach. See the IMAGINE Expert Classifier™ section in the IMAGINE Professional Product Description for more details about the IMAGINE Expert Classifier.

About ERDAS

ERDAS – The Earth to Business Company – helps organizations harness the information of the changing earth for greater advantage.

ERDAS creates geospatial business systems that transform our earth's data into business information, enabling individuals, businesses and public agencies to quickly access, manage, process and share that information from anywhere.

Using secure geospatial information, ERDAS solutions improve employee, customer and partner visibility to information, enabling them to respond faster and collaborate better. It also means better decision-making, increased productivity and new revenue streams.

ERDAS is a part of the Hexagon Group, Sweden. For more information about ERDAS or its products and services, please call +1 770 776 3400, toll free +1 866 534 2286, or visit www.erdas.com.