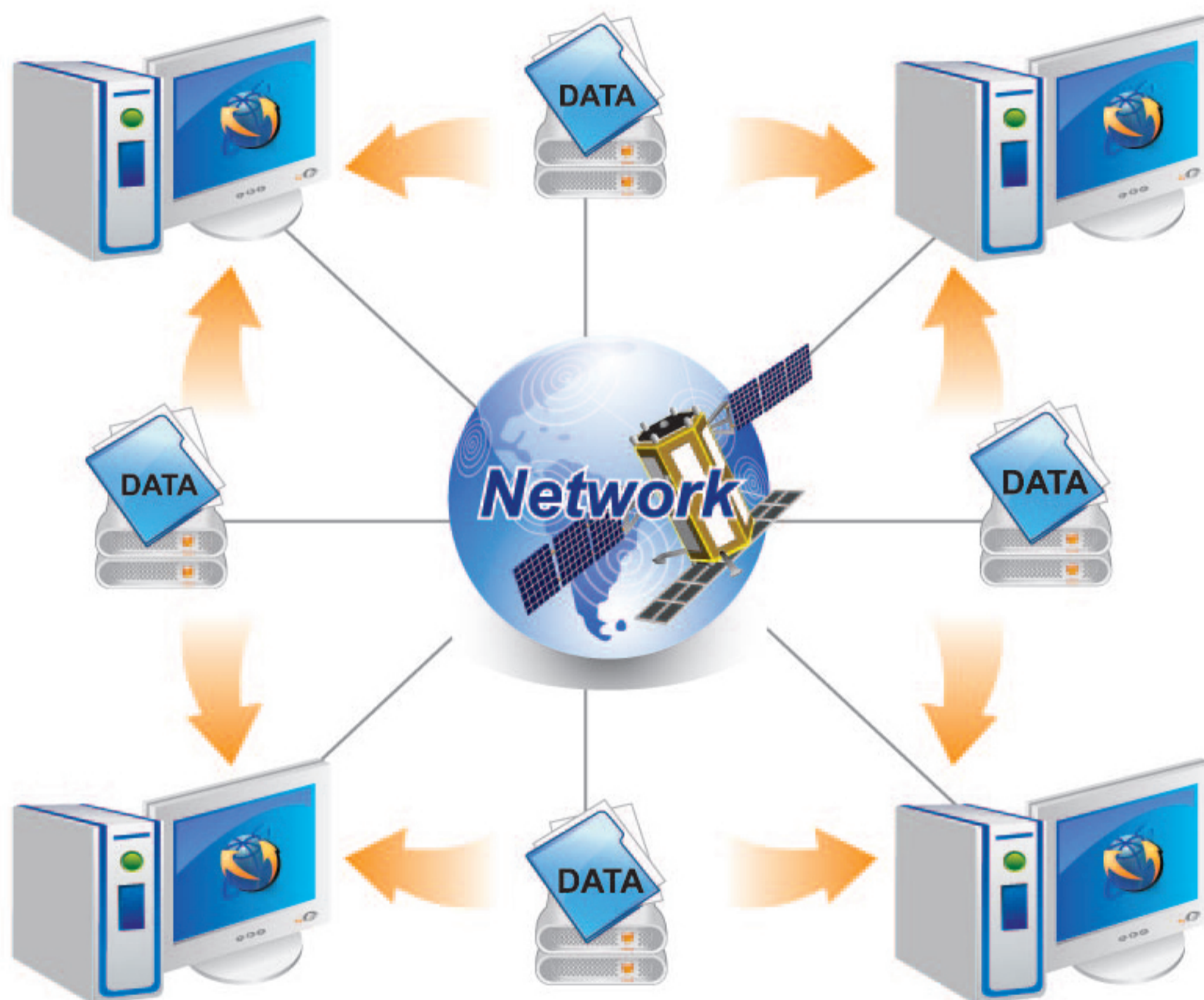pi**x**oneer
geomatics
http://www.pixoneer.com

"Network RealTime Processing",
*a Smart and Fast Way of Image Processing.*

PG-STEAMER

Pixoneer Geomatics Software Tools for Exploitation And Management of Earth Resources

DATA

DATA

DATA

DATA

Network

DATA

With realtime processing
get immediate results
regardless of the size of your data.

PG-STEAMER is a professional environment for the processing, analysis, visualization, and documentation of remotely sensed (RS) data.

The key features of PG-STEAMER4.2 is its network realtime data processing capabilities, which are a unique and highly advanced technology for the processing of unlimited sized image data in realtime, and in both a stand-alone and local area network environment.

| Select input data | Set parameters | Instant Result |
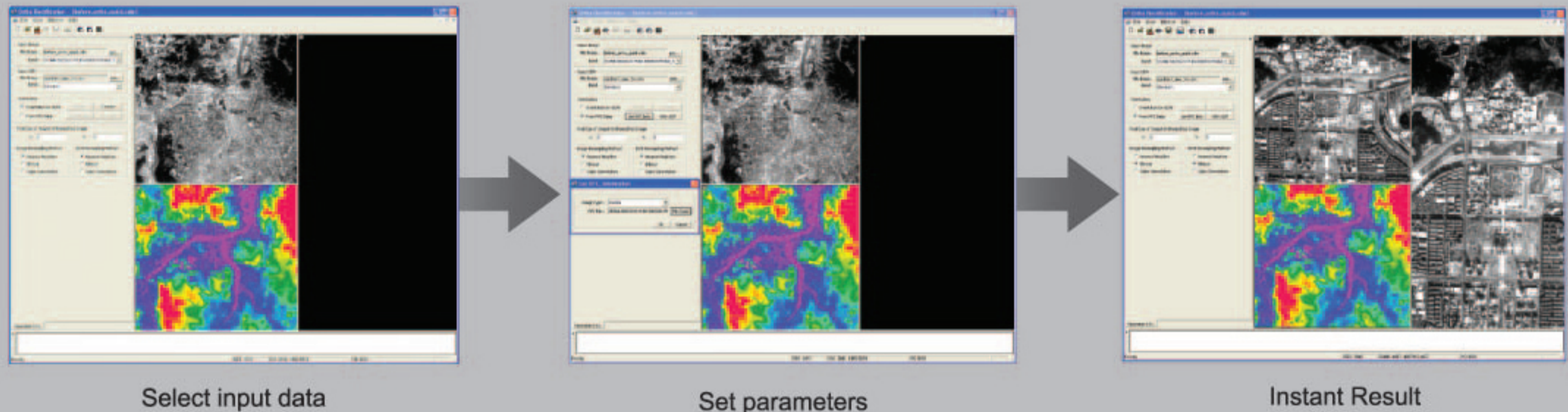
The concept of RTP

RealTime Processing (RTP)

Realtime Processing is a processing system that enables a user to Process and analyze their image instantly.

It eliminates the pitfalls of the traditional "trial and error" time consuming workflow, while still delivering accurate results.

The problem with the traditional image processing workflow is that it is usually very slow for images with large file sizes, which is common in remote sensing.

This slow pace can be very tedious for the user. With RTP, you completely avoid traditional image processing workflow steps and simply view the resulting product image instantly.

Network RealTime Processing (NRP)

Even more amazing, this entire process is capable in a local area network environment.

Benefits of RTP Technology

What are the benefits of Real Time Processing?

- Instant results. The processing results can be viewed as soon as you enter the processing parameters.

- Save Time. You don't have to test your patience waiting for the results. Simply add your processing parameters, and instantly see the result in the display window.

- Reduce Guess work. Not sure of the exact processing parameters to use? Reduce the trial-and-error loop with RTP since you'll quickly see the validity of your processing.

- View at any detail level. Using real time processing, there are no restrictions to the display window size. View the results at the detail level you desire.

Availability of RTP Functionality

- Geometric Correction
- Topographic Correction
- Classification
- Image Sharpening
- Mosaicking
- Change Detection
- Tiler
- Multi Spectral Analysis
- Band Math
- Orthorectification
- Spatial Filtering
- Frequency Filtering
- Resizing
- Rotate and Flip
- Principal Components Analysis
- Map Projection Convert
- Radiometric Normalization
- Index Transformation
- Contour Manager
- Masking
- Topographic Modeling
- Auto GCP Matching
- DEM Interpolation
- Stereo DEM Generation
- Pixel Editor
- Etc.

Freedom From Coordinate Conversion

If you don't know much about geographic coordinate systems, you no longer need to worry. With the enhanced Visual Analyzed module of PG-STEAMER, you can browse multiple data sets of different coordinate systems without ever having to convert your data into a single coordinate system.

Also, PG-STEAMER is now smart enough to process multiple data sets in their correct geographic positions based upon the chosen output coordinate system. For example, if you have multiple data sets, all in different coordinate systems, PG-STEAMER can now mosaic these data sets just by opening the data sets and exporting them to a single data file.

UTM coordinate system

Geographic coordinate system
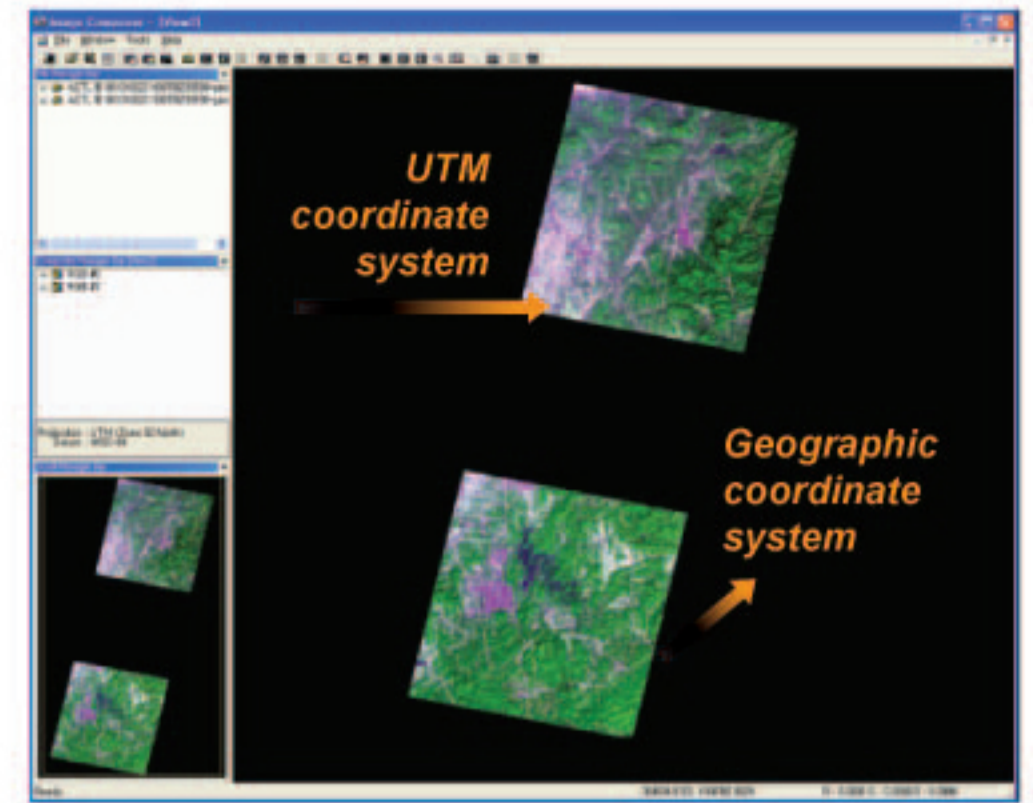
Feature Tour

Catalog

Catalog lists available images, vectors and DEMs, and provides a very convenient Drag-&-Drop interface to other PG-Steamer functions.
- On-the-fly Browsing
- Support not only Raster, but also Vector & DEM
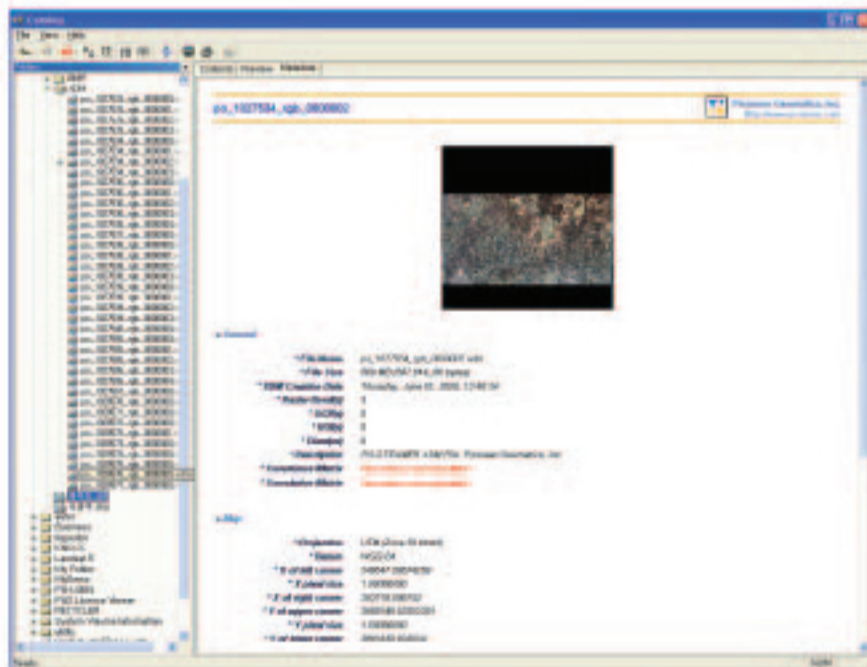- Drag & Drop interface with all the functions

Image Composer

Image Composer is a multi-file visual analysis environment for images and vectors which supports a multii-coordinate system, and auto mosaic. You can open as many images and vectors in one Image Composer window, and their coordinate system doesn't have to be the same. There is no limit to the file size or the number of files you can open in one Image Composer window.
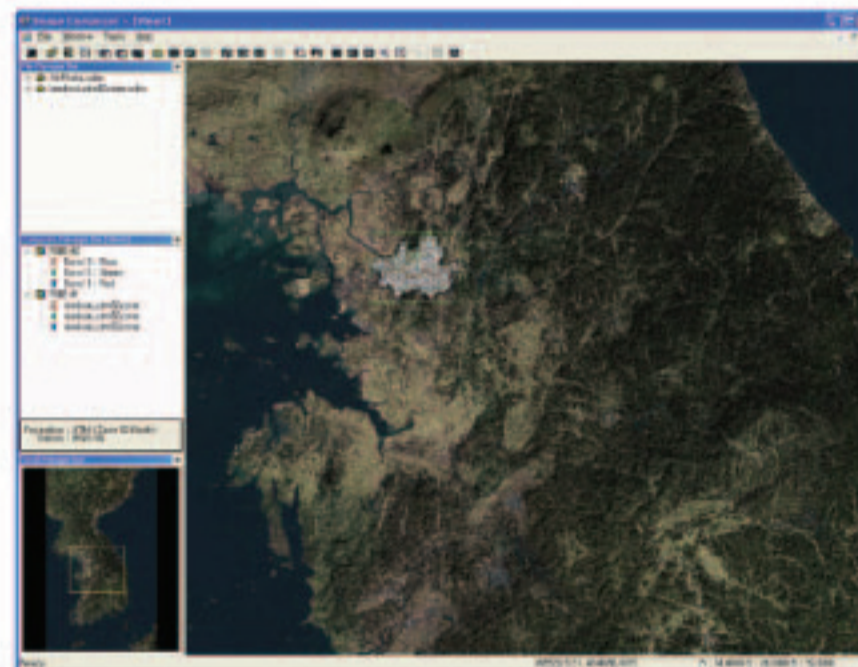
Geometric Correction

GCP geometric correction module provides a realtime environment to select or edit GCPs.
GCP manager displays a corrected result image in realtime as soon as GCP is selected, added or changed. And you can also overlay a reference image on top of a result image and edit GCPs using the overlayed image.
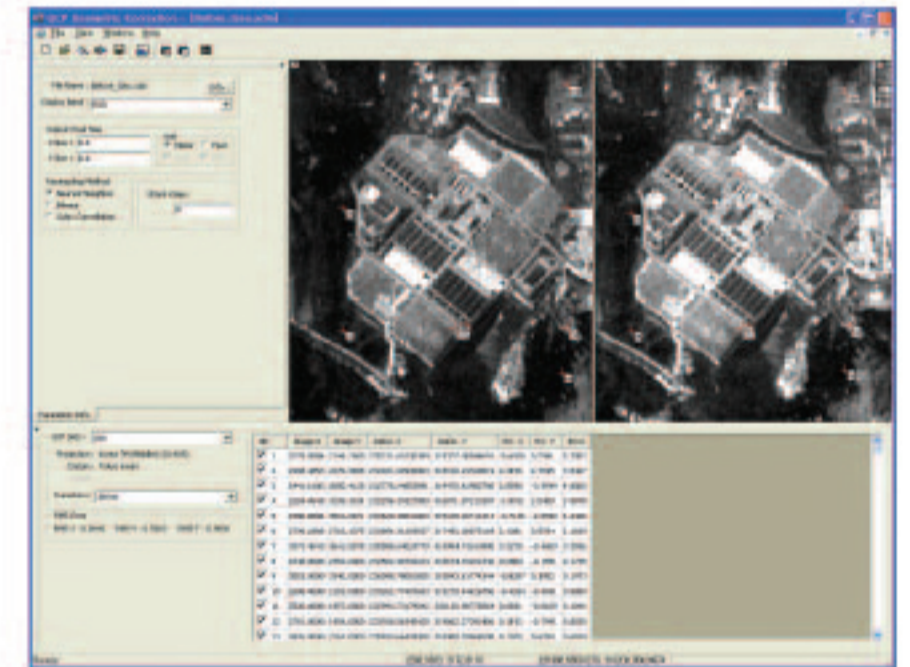

Orthorectification

Orthorectification module produces orthorectified images using RPC for IKONOS, Quickbird, Orbview, and GCP for IRS, KOMPSAT-1/2/3, SPOT IKONOS, Quickbird, ALOS, Geoeye, WorldView1/2
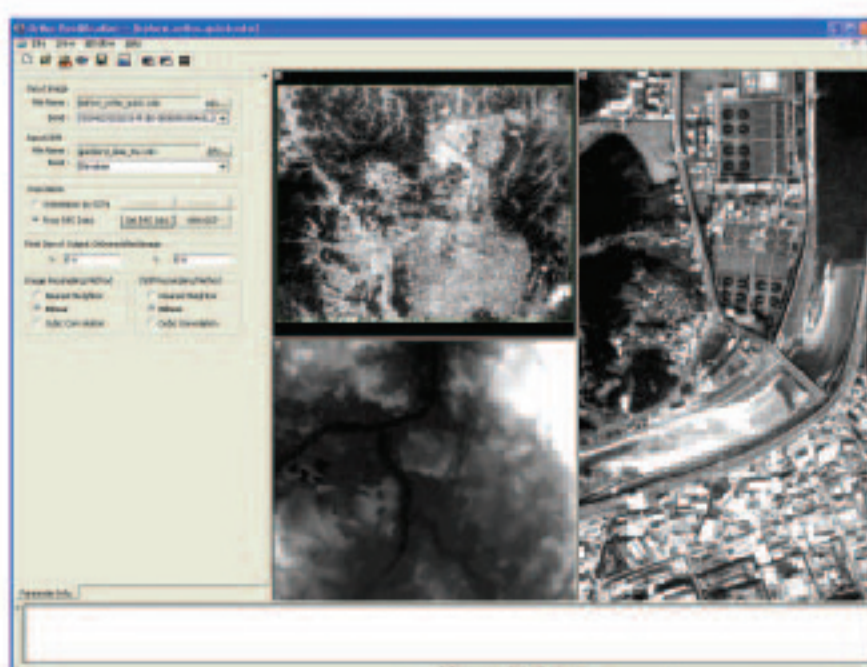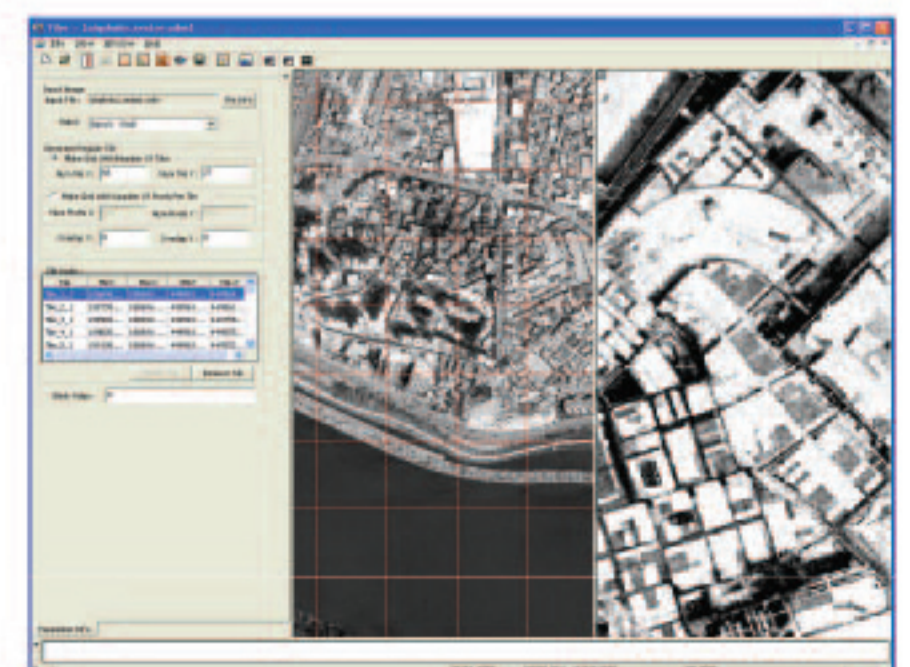
Mosaic

PG-STEAMER provides an automatic mosaic envi ronment for images with different coordinate systems. Smoothing, masking and histogram matching functions make the mosa-iced image more seamless.
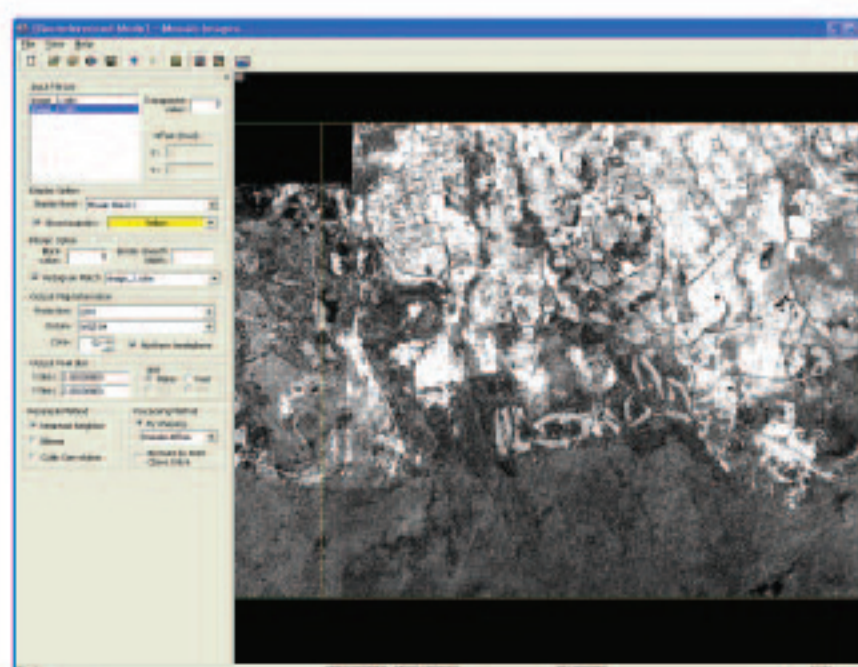
Resize & Tiling

With PG-STEAMER, you can convert one image into multiple tiled images, and tiled images into one image.

Vector Composer

In Vector Composer, you can create and edit vectors with images in various geo-coordinates. Vector Composer supports the database feature with vector files such as XVC, DXF, DGN and SHP.
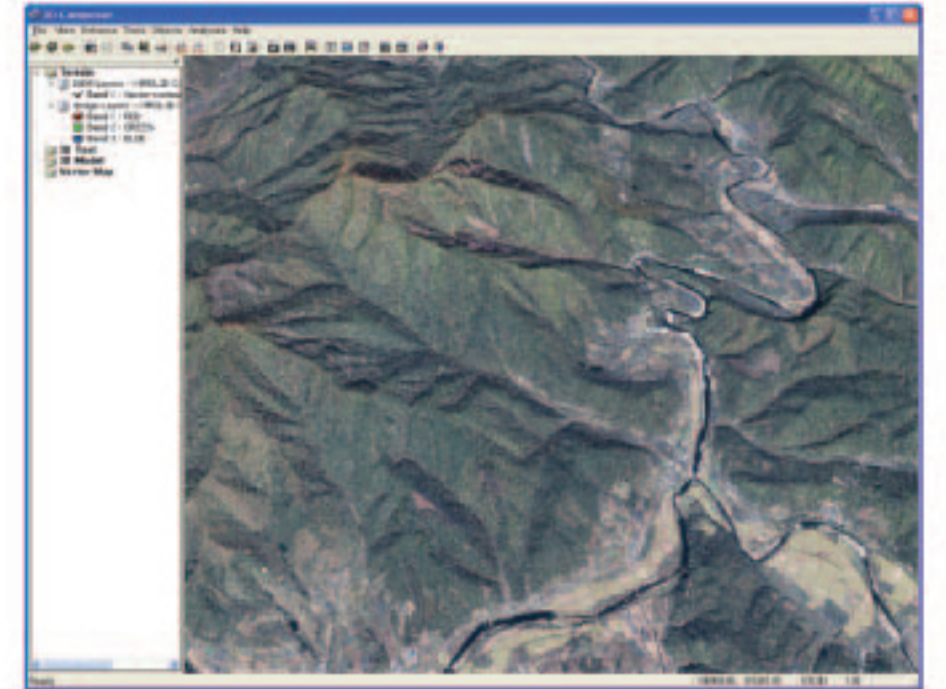
DEM Generation

DEM Generation module generates the digital elevation from Stereoe-Images, Vector files and LIDAR data with a precise interior/exterior orientation model.
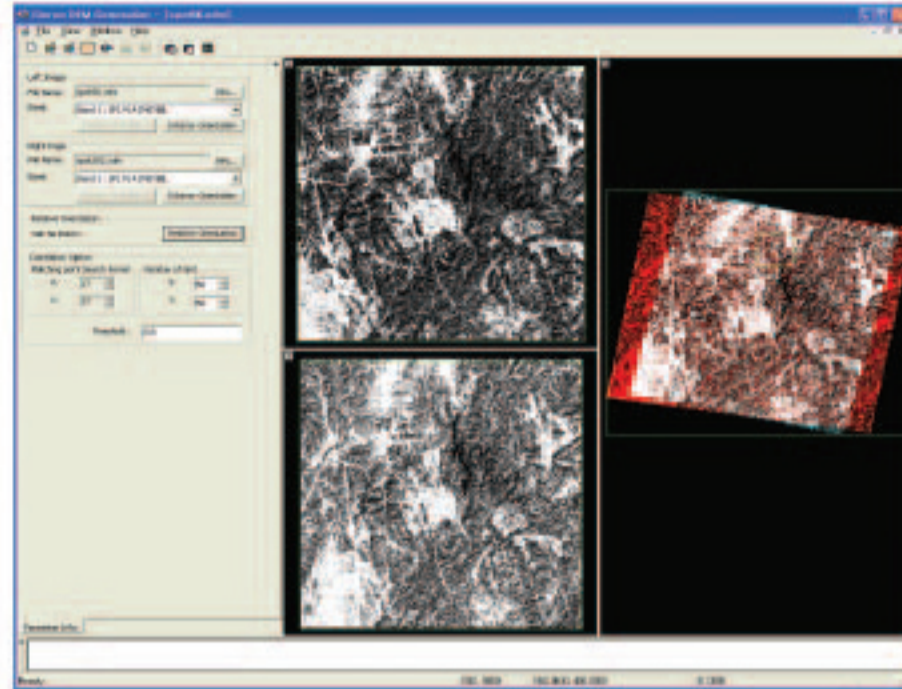
3D Composer

3D Composer provides a 3-D analysis environment using DEM and image. The functions in 3D composer are LOS (line-of-sight) analysis, 3-D flying, Path analysis and etc.

Multi Spectral Analysis Tools

MSA (Multi Spectral Analysis) functions in PG-STEAMER are End Member Creation, Atmospheric Correction (IAR Reflection Correction, Flat Field Correction, Empirical Line Correction), Spectral Feature Matching, Spectral Angle Mapper Classification, Line Spectral Unл-mixing, Spectral Feature Mapping and etc.
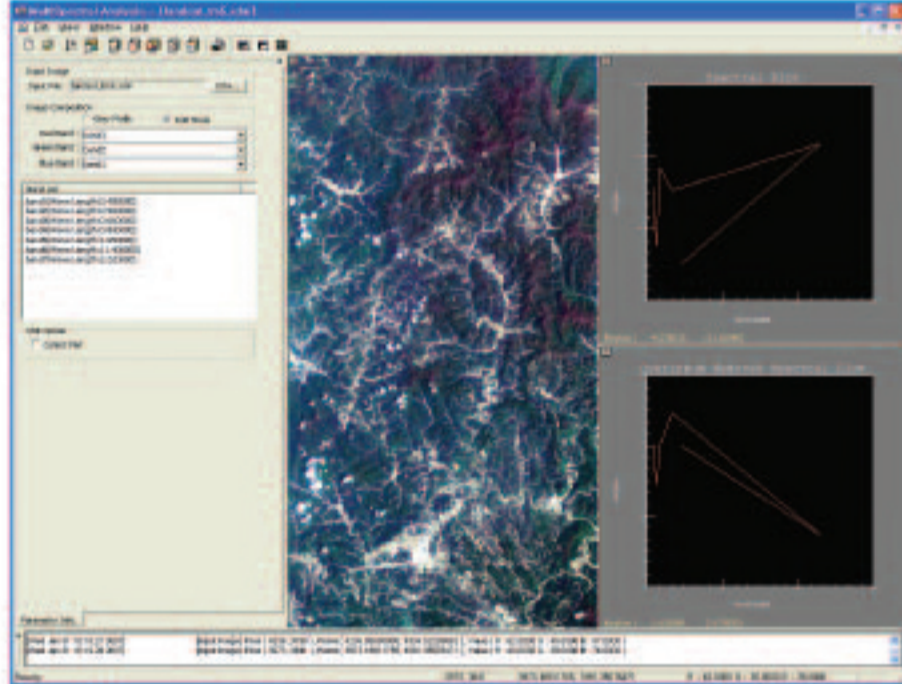
Change Detection

Image Compare module detects changes between two images, and the detected changes are displayed with various color tables and may be saved as a vector file. Change detection methods used in PG-STEAMER are Angle, Color Composite, Image Differencing and Image rationing.
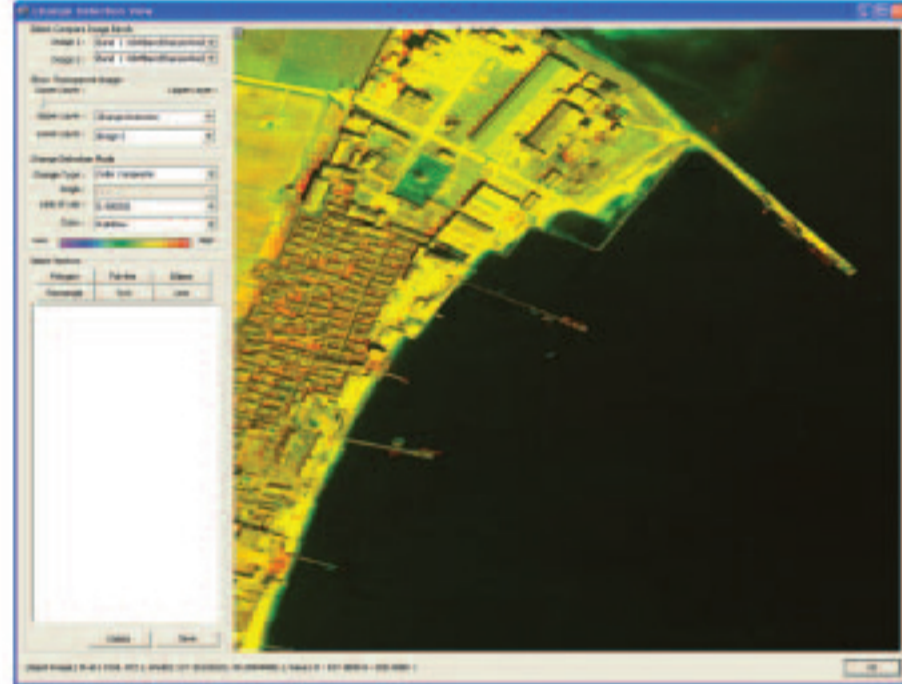
Map Composer

Map Composer is an easy-to-use environment to create and edit image maps. You can generate a grid automatically, and add map components easily as a scale bar, legend, lines, polygons, text box and etc. WYSIWYG printing is supported.
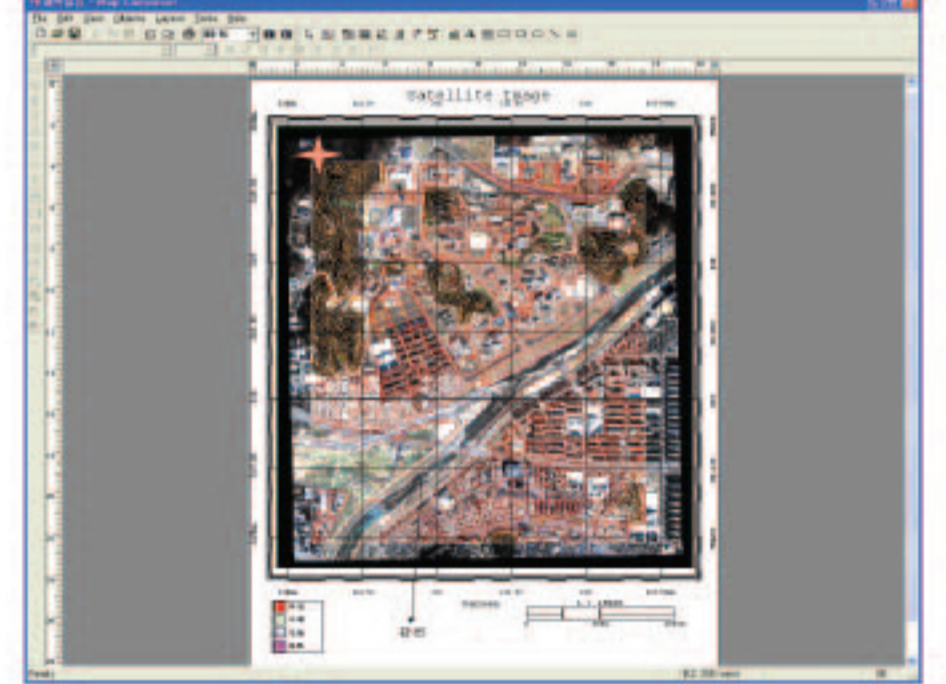
Classification

Due to the realtime capability, classification is easy and fast. Both unsupervised classifications (Sequential, K-Means, ISODATA) and supervised classifications (Minimum Distance, Parallelpiped, Mahalanobis, Maximum Likelihood, Spectral Angle Mapper, Neural Network) are supported.
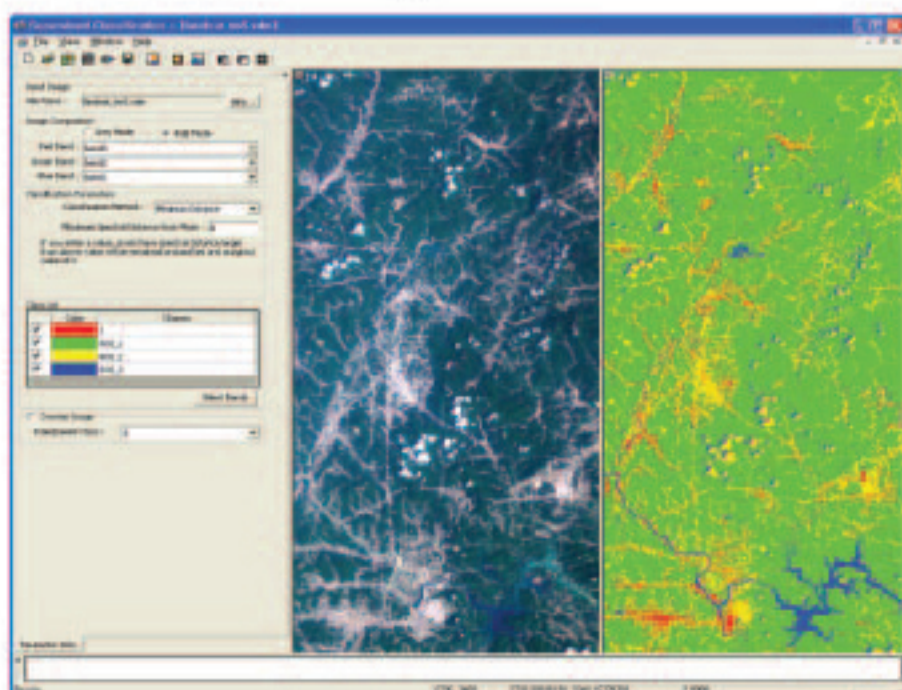
Image Local Warping

Image Local Warping module generates a warped image onto the reference image by automatically finding as many tie-points as possible between two images, and may be used as a more advanced image warping method than the geometric correction or other correction methods.
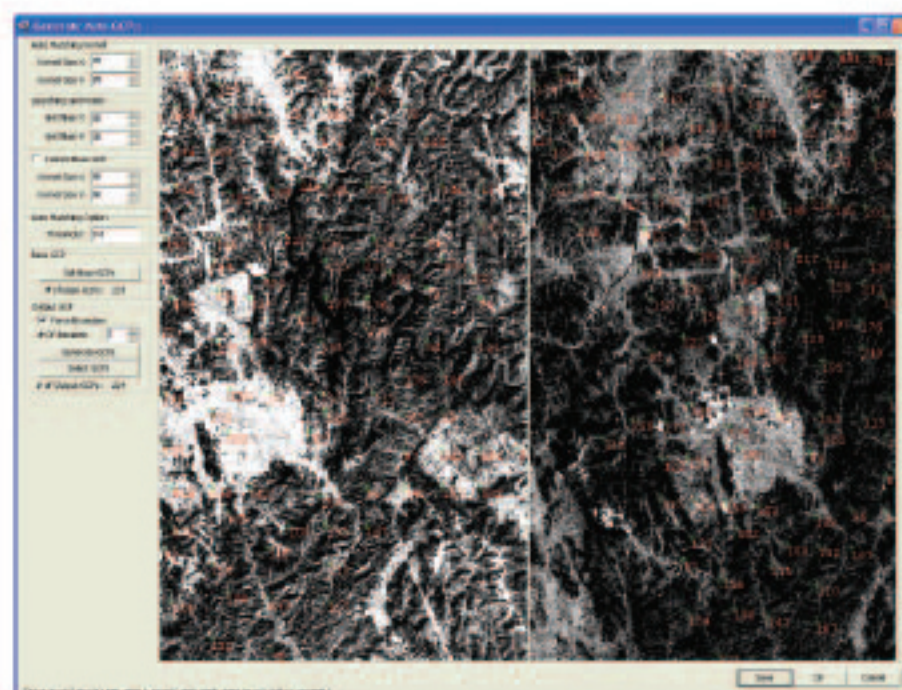
Auto GCP Matching

Auto GCP Matching module generates new GCPs automatically within one-pixel error range by matching two images evenly with different coordinate systems. The minimum number of GCPs required to initiate auto GCP matching is three.
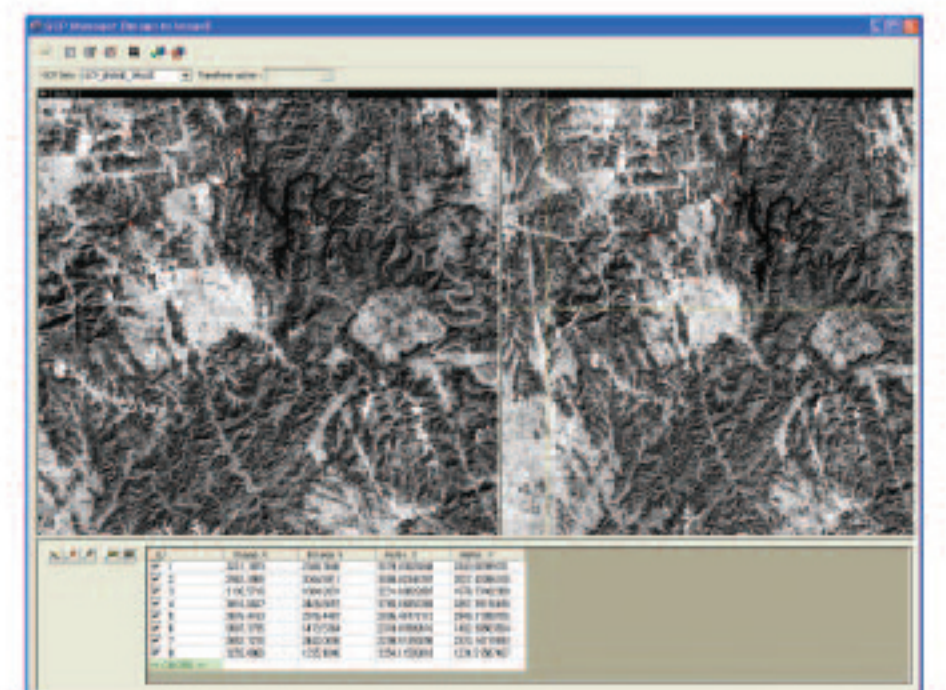
Functional Summary

Why Choose PG-STEAMER?
- Real Time Processing(RTP) at any detail level without file size limitation
- Single interface paradigm for all functionalities
- Quick browsing of multiple bands/multiple files
- Coordinate free inter-file, inter-band composition
- Direct reading and processing of images without importing
- Easy to use interface & functionality
- Comprehensive functionality and capabilities
- Enhanced vector editor with database access for GIS functionalities
- Efficient memory management
- Robust image processing tools
- Powerful data structure
- Comprehensive training

Catalog `3D`
- View Metadata from raster(XDM, JPEG, BMP, TIFF, MrSID, JPEG2000) and Vector(XVC, DXF, SHP, DGN, XYZ, LAS, NITF, XPT, XTN)
- Preview data file(Raster , Vector)
- Export to HTML file from metadata

Image Composer
- Open multiple datasets in multiple coordinate system
- Gray/RGB/HSI Composition of bands from different files in different coordinate systems
- Auto-warping and mosaic with raster and vector bands
- Multiple composites in a single view
- Z-layering of composites with transparency
- Dynamic changing of viewing coordinate system
- Direct reading of images without importing
- MDI (Multiple Document Interface)
- New Enhanced Histogram stretch tools
- Quick Enhance
- Exporting composites to XDM file or BMP, JPEG, Tiff and Geotiff.
- Georeferenced linking
- Show 3 kinds of coordinates(original, geographic lat/lon, MGRS)
- Locating specific position
- Measuring tool
- Spatial Profiles, Spectral Profiles
- Screen Digitizing
- Statistics (Histogram, Scattergram)
- Vector File overlay
- Interactive Histogram Stretch
- Dynamic Zoom In/out

Image Analyzer
- Open single dataset
- Gray/RGB/HSI Composition of band
- Directing reading of images without importing
- New Enhanced Histogram stretch tools
- Quick Enhance
- Exporting composites to XDM file or BMP, JPEG, Tiff and Geotiff
- Show 3 kinds of coordinates (original, geographic lat/lon, MGRS)
- Locating specific position
- Measuring tool
- Spatial Profiles, Spectral Profiles
- Screen Digitizing
- Statistics (Histogram, Scattergram)
- Vector File overlay
- Dynamic Zoom In/out
- Interactive Histogram Stretch

Vector Composer
- Support DXF, DGN, KML, SHP, XPY, XYZ, XVC

- Open multiple vector files
- Database connection(Microsoft Access Database)
- Spatial Query, Property Query
- Overlay image files
- Create/Edit vector file
- Coordinate conversion from vector file
- Ddatabase/Chart/Symbol editor
- Quick Enhance
- Interactive Histogram Stretch

3D Composer
- Increase Z scale
- Decrease Z scale
- Palette Select/Edit
- Quick Enhance
- Interactive 3D View
- Flying Simulation
- Path Analysis
- Line of Sight Analysis
- Data manipulation tools
- Viewing options
  - Overlay Annotation
  - Overlay 3D Object
  - Overlay Vector Map
  - Topographic Modeling
  - Save BMP
  - Copy to Clipboard
  - Record and Save to AVI format
  - Start/Stop Recording

Map Composer
- File – Open, Save Print & Export
- Edit – Cut, Copy, Paste, Size, Position & Vector Editor
- View – Zoom in, Zoom out, Tool bars, Status Bars & Rulers
- Objects – Map Image, Map grid, Scale bar, North arrow, Legend, Color bar, Image, Text, Text box, Polygon, Line, Ellipse & Rectangle
- Layout – Align, Space adjustment, Make same size, Order, Locate in
- Tools – MXH Editor(header information)
- Auto gridding for map image
- Vector overlay on map image
- Open graphic images and vector files
- Maximum A0 size WYSIWYG printing
- Tile printing for big workspace

Tools and Utilities
- Import
  - Display Position On World Map
  - Display Image Information Before Import
  - Multiple file import
  - Overlay DXF vector file
- Export
  - Display Position On World Map
  - Multiple file export
- File Information
  - Thumbnail band view
  - Open multiple files
  - Bound coordinate or position of image
  - Simple gray/RGB image viewing
  - Statistics (Histogram, scattergram, Min, Max, Mean, Standard Deviation, Covariance Matrix, Correlation Matrix)
- File Tools
  - Edit header infomation
  - Import band
  - Remove band
  - Convert data type
  - GCP/ROI/SIG Edit
- Mosaic Images `RTP`
  - Mosaic between multiple files in different

coordinate system and pixel size
  - Various composition of mosaic band from multiple input bands
  - Transparent value for each file
  - Multiple polygon masking with region math
  - Border smoothing
  - Histogram matching
  - X/Y Offset of files in output coordinate
  - Support thumbnail view for each band
  - Change Output pixel size and coordinate system
- Mask Image `RTP` `3D`
  - Multiple polygon masking with polygon math
  - Blank value
- Resize Image `RTP` `3D`
  - Subset region from pixel/world coordinate and other files
  - Nearest Neighbor/ Bilinear/ Cubic Interpolation
  - Blank value
- Tiler `RTP` `3D`
  - Subset region from pixel/world coordinate and other file
  - Make/Clear Tile bound
  - Make Grid with number of tiles
  - Make Grid with number of pixels per tile
  - Merge from Tiled image
- Flip/Rotate Image `RTP` `3D`
  - Flip First and then Rotate
  - Arbitrary angle rotation
  - Specify rotation center
  - Blank value
- Convert Map Projection
- Pixel Editor
  - Change selected pixels with input value
  - Change selected pixels with average value
  - Change center pixel with average value
  - Interpolate selected lines
  - Cut high value with input threshold
  - Cut low value with input threshold
  - Unlimited Undo/Redo
- Coordinate Conversion
  - Convert multiple positions in one time
  - Save/Load positions to/from text files with separators
  - User-define projection
  - Location identification on world map
- Image Local Warping `RTP` `3D`
  - Automatic GCP generation
  - Image matching with local GCPs
- Image Compare `RTP`
  - Transparent change detection
  - Angle change detection
  - Color composite change detection
  - Image Rationing change detection
  - Image Differencing change detection
  - Compare Spectral Profile
  - Make vector file from change area
- Compute sun angle
- Link View
  - Link input/output bands in a view

DEM Tools
- Stereo DEM generation `RTP` `3D`
  - Auto-extracting elevation for GCP from DEM
- Stereo DEM upgrade `RTP` `3D`
  - Auto-extracting elevation for GCP from DEM
- DEM generation from vector
- DEM generation from LiDAR
- DEM Interpolation `RTP` `3D`
  - Nearest Neighbor, Inverse Distance, Kriging, Triangulate
- Topographic Modeling `RTP` `3D`
  - Slope, Shaded Relief, Aspect

Image Processing

- Geometric Correction `RTP` `3D`
  - Prediction for new GCP
  - Select GCP on the expected result image
  - Drag-and-Drop control point addition
- Auto GCP Matching
- Orthorectification GCPs & RPC `RTP` `3D`
  - Post correction with GCP after RPC orthorectification
  - Interior/Exterior/Relative Orientation
  - RPC(Ikonos, Quickbird, Orbview)
  - Auto-extracting elevation for GCP from DEM
- Radiometric Normalization `RTP` `3D`
- Topographic correction `RTP` `3D`
- Unsupervised classification
  - Sequential, K-Means, ISODATA
  - Accuracy Assessment
- Supervised classification `RTP` `3D`
  - Minimum Distance, Parallelipiped, Mahalanobis, Maximum Likelihood, Spectral Angle Mapper, Neural Network
  - Accuracy Assessment
  - ROI Definition : Points, Polylines, Polygons
- Feature Extraction `3D`
  - Extract from Point, Rectangular, Polygon
  - Dilate/Erode, Expand/Shrink
- Class Editor `3D`
  - Edit class information
- Raster To GIS `3D`
  - Make GIS data from Raster
- Contour Manager `RTP`
  - Patch Contouring for Huge-sized image
  - Specify multiple z-levels with histogram plot
- Image Sharpening `RTP`
  - IHS/Brovey Sharpening
  - Adjust Color/sharpen match
- Index Transformation `RTP` `3D`
  - NDVI, DVI, TVI, SBI, GVI
  - Tasseled Cap
  - ASTER TIR MCSST
- Principle Component Analysis `RTP` `3D`
- Band Math `RTP` `3D`
  - Conditional Math
- Spatial Filtering `RTP` `3D`
  - General, Adaptive, Texture, User Define Filter
- Frequency Filtering `3D`
  - Low Pass, High Pass, Band Pass, Band Reject, Direction Pass, Direction Reject Filter
- Multispectral Analysis `3D`
  - End member generation
  - Atmospheric Correction (IAR reflectance correction, Flat Field correction, Empirical Line correction)
  - Spectral Feature Matching
  - Spectral Angle mapper classification
  - Linear spectral unmixing
  - Spectral feature matching
  - Spectral library builder
  - Generate continuum removed image
  - Spectral band animation

Supported Formats

Satellite Images

- ALOS AVNIR-2/PALSAR/PRISM
- ASTER 1A/1B, 2A/2B, 3A, 4A
- AVHRR POD
- Envisat ASAR
- EROS L1A/L1B
- ERS
- FORMOSAT DIMAP
- Hyperion
- Ikonos GeoTIFF
- Ikonos NITF
- IRS Fast
- JERS-1 Optical/SAR
- KOMPSAT-1 / 2 / 3
- LANDSAT CEOS
- LANDSAT HDF
- LANDSAT MRLC
- LANDSAT NDF
- LANDSAT5 FAST
- LANDSAT7 FAST
- MODIS Level 1B/3
- QUICKBIRD GeoTIFF
- QUICKBIRD NITF
- RADARSAT
- SeaWiFS
- SPOT CEOS
- SPOT 5 DIMAP
- GeoEye1
- WorldView 1 / 2

Remote Sensing Images

- Import Images
  - ArcInfo GRID Binary
  - ArcView Raster
  - PG-STEAMER IDM
  - ENVI
  - Erdas IMG
  - Erdas LAN
  - ERMapper ERS
  - ERMapper ECW
  - MrSID SID
  - PCI PIX
- Export Images
  - Erdas 7.5 (lan)
  - Erdas 8.x (img)
  - PCIDSK (pix)
  - ERMapper (ers)
  - ENVI
  - ArcView (bil)
  - PG-STEAMER (idm)

Graphic Images

- Import Images
  - Arc Ascii Grid
  - BMP/BMW
  - CADRG/CIB
  - GeoTIFF
  - GRD
  - HDF
  - Japanese GSI Map Image
  - JPEG/JPW
  - JPEG2000

- NITF
- PCX
- PNG/KML
- TARGA
- TIFF/TFW
- Export Images
  - GeoTIFF
  - TIFF
  - BMP
  - JPEG
  - KML
  - PNG

Generic Images

- Import Images
  - ASCII BIL
  - ASCII BIP
  - ASCII BSQ
  - Binary BIL
  - Binary BIP
  - Binary BSQ
- Export Images
  - ASCII GRID
  - BIL
  - BIP
  - BSQ
  - XYZ

DEM/DTED

- DMA DTED
- GTOP30
- Hokkaido-chizu DEM
- Japan GIS-DEM LEM
- Japan GIS-DEM MEM
- USGS DEM
- USGS SDTS DEM
- USGS SRTM
- ETOPO2