

## GXL PAN Sharpening

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The PANSHARP2 algorithm applies an automatic image fusion that increases the resolution of multispectral (color) image data by using a high-resolution panchromatic (B&W) image. Most Earth resource satellites, such as SPOT, IRS, Landsat 7, IKONOS, KompSat2, QuickBird and WorldView2, provide multispectral images at a lower spatial resolution and panchromatic images at a higher spatial resolution. This allows you to easily fuse images acquired simultaneously by the same sensor. Alternatively, you can fuse images from different sensors.

PANSHARP2 works with 8-bit, 16-bit, or 32-bit real data types.

### *MODULE PREREQUISITES*

GXL PAN Sharpening is an add-on to the base system. It requires a GXL system as a pre-requisite.

### *PANSHARP2 ALGORITHM*

The PANSHARP2 algorithm is based on the least number of squares to an approximate gray-value relationship between the original multispectral image, panchromatic image, and fused image. Using the PANSHARP2 algorithm, you can:

- Solve color-distortion and operator- and data-dependency problems
- Achieve the best color representation
- Preserve the mean, standard deviation, and histogram shape for each channel
- Fuse all spectral bands of a satellite image with the corresponding panchromatic band at once
- Minimize color distortion, maximize feature detail, and naturally integrate color and spatial features
- Optimize parallel processing through OpenMP

### *PANSHARP2 INPUT IMAGES*

The PANSHARP2 algorithm requires the following input images:

- Multispectral Image Layers:
  - Spectral layers to be fused with a high-resolution panchromatic image layer
- Reference Multispectral Image Layers:
  - Aid in the pan-sharpening process
  - Span the same frequency range as the panchromatic image layer
  - Vary from sensor to sensor
- Panchromatic Image Layer:
  - Used for pan-sharpening multispectral image layers

## *PANSHARP2 OPTIONS*

The PANSHARP2 algorithm offers:

- Enhanced pan sharpening:
  - Generates a refined pan-sharpened output image
  - "Yes" option: generates a refined pan-sharpened output image (more suitable for visualization or visual interpretation purposes)
  - "No" option: generates a standard pan-sharpened output image (more suitable for digital classification purposes)
- No-data image value:
  - Specifies a background value for all layers
- Pyramid options:
  - Specifies the type of resampling to use when computing overview levels (Nearest Neighbor, Average, or Model)

## *FOR BEST RESULTS*

When using the PANSHARP2 algorithm, it is recommended that you:

- Use multispectral-image channels whose wavelengths lie within the frequency range of the panchromatic image channels
- Do not exceed the ratio of resolutions between the two images by more than 5:1

### **For more information, contact**

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