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Geoapplications development  
<http://rgeo.wikience.org>

# **Training 5 or 7**

## **Java Advanced Imaging**

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# JAI

## API for image processing:

- **JAI (Java Advanced Imaging)** – many operations (not with a complete set of options)
- **JAI-EXT** improves JAI (IT Geosolutions extension)

[https://en.wikipedia.org/wiki/Java\\_Advanced\\_Imaging](https://en.wikipedia.org/wiki/Java_Advanced_Imaging)

<https://github.com/geosolutions-it/jai-ext/>


<http://docs.geotools.org/latest/userguide/tutorial/raster/jaiext.html>

<https://github.com/geosolutions-it/jai-ext/wiki/Fifteen-minutes-Guide>

# JAI-EXT

GitHub, Inc. (US) | <https://github.com/geosolutions-it/jai-ext>

Branch: **master** ▾ **jai-ext / +**

 **aaime** Show the full name of the op (to tell apart jai and jai-ex)

<a href="#">jt-affine</a>	Back to snapshot version
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<a href="#">jt-classifier</a>	Back to snapshot version
<a href="#">jt-colorconvert</a>	Back to snapshot version

## Some modules:

<a href="#">jt-colorindexer</a>	Close #87
<a href="#">jt-concurrent-tile-cache</a>	Back to snapshot version
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<a href="#">jt-rescale</a>	Back to snapshot version

# JAI: creating operations

At least 4 ways to launch an operation:

1. ImageWorker
2. CoverageProcessor
3. Dedicatied factories
4. JAI.create – the most generic

The JAI.create may be considered when other options do not provide the required operation

# JAI: CoverageProcessor

```
CoverageProcessor processor = CoverageProcessor.getInstance();  
System.out.println(processor.getOperations());
```

```
[Absolute[Absolute], Add[Add], AddConst[AddConst], Affine[Affine],  
Convolve[Convolve], Crop[CoverageCrop],  
DivideByConst[DivideByConst], Exp[Exp], Extrema[Extrema],  
FilteredSubsample[FilteredSubsample],  
GradientMagnitude[GradientMagnitude], Histogram[Histogram],  
Interpolate[Interpolate], Invert[Invert], Log[Log], MaxFilter[MaxFilter],  
MedianFilter[MedianFilter], MinFilter[MinFilter], Mosaic[Mosaic],  
Multiply[Multiply], MultiplyConst[MultiplyConst],  
Resample[Resample], Rescale[Rescale], Scale[Scale],  
SelectSampleDimension[SelectSampleDimension],  
SubsampleAverage[SubsampleAverage],  
SubtractConst[SubtractConst],  
SubtractFromConst[SubtractFromConst], Warp[Warp],  
ZonalStats[ZonalStats]]
```

# JAI: ImageWorker

**ImageWorker worker = new ImageWorker(RED);**

Rescale

Crop

Also limited set of operations

<http://docs.geotools.org/stable/javadocs/org/geotools/image/ImageWorker.html>

# JAI: JAI.create

```
ParameterBlock pbSubtracted = new ParameterBlock();  
pbSubtracted.addSource(NIR);  
pbSubtracted.addSource(RED);
```

```
RenderedOp subtractedImage =  
    JAI.create("subtract", pbSubtracted);
```

Do all operations

# JAI: factories

```
RenderedOp rescaled = RescaleDescriptor.create(source, scales,  
offsets, roi, noDataRange, useRoiAccessor, destNoData, hints);
```

```
// For calculating all the tiles  
Raster[] data = rescaled.getTiles();  
// For calculating a single tile  
// x = tile X coordinate;  
// y = tile Y coordinate;  
Raster tile = rescaled.getTile(x, y);
```

<https://github.com/geosolutions-it/jai-ext/wiki/Fifteen-minutes-Guide>





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Thank you  
for your attention!