

Geomatica Modeler v10.3 Tutorial

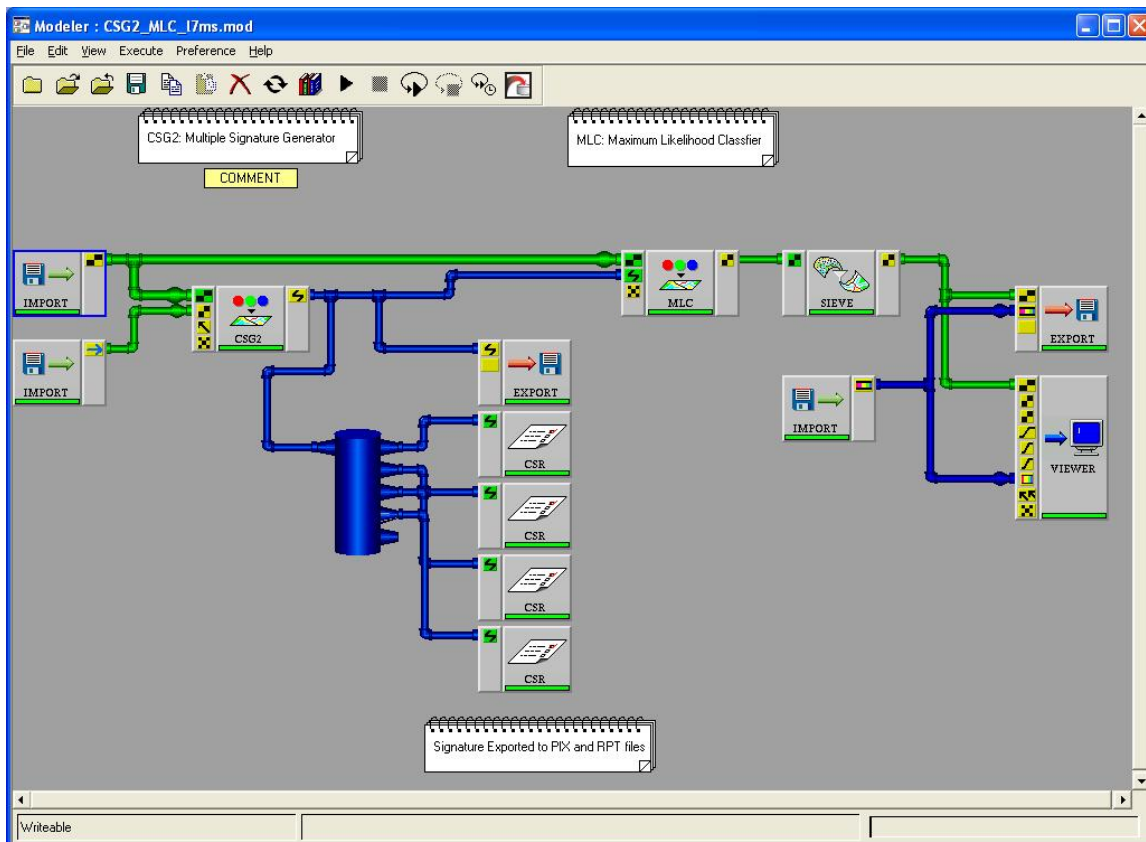
Multiple Signature Generator (CSG2) and Maximum Likelihood Classifier (MLC) Model

CSG2 or Multiple Signature Generator is a new algorithm introduced in PCI Geomatica 10.3. CSG2 is an enhancement of our older CSG algorithm (Classifier Signature Generator). With the introduction of CSG2 algorithm, CSG will be retired in future versions of Geomatica.

Apart from the regular bitmap masks, CSG2 is also capable of using vector layers for training areas. The user can also specify a raster training channel that can be created from multiple bitmap masks using the MAP algorithm. CSG2 can create multiple signatures in a single pass which allows a high degree of flexibility to the user. These signatures can be stored in a pix file and in the form of individual reports.

MLC or Maximum Likelihood Classifier is a standard image classification algorithm. MLC performs either parallelepiped or maximum likelihood multi-class classification on image data for up to 254 classes.

Below is a visual modeler example of the new CSG2 algorithm.

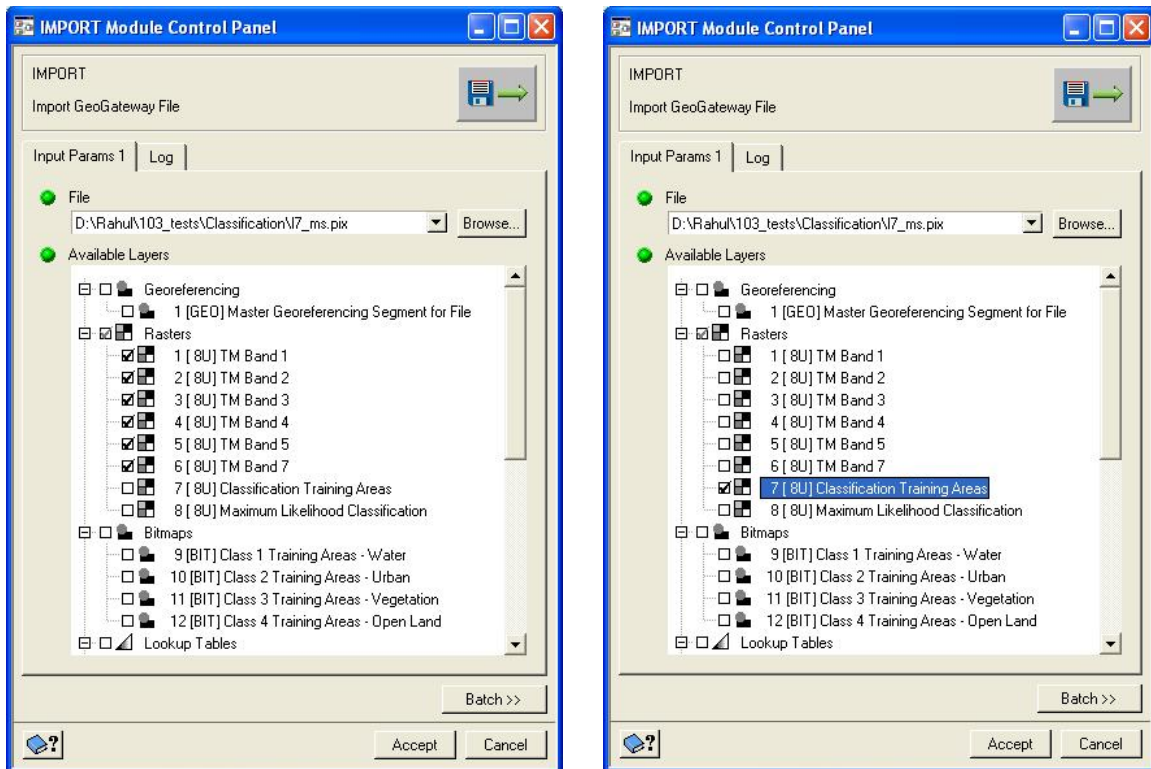


1.0 Geomatica Modeler

1.1 Data Import

Start Geomatica Modeler and create a new project using File | New Model. Use View | Module Librarian – Algorithm Library – PCI Predefined – All Algorithms – IMPORT and drag two IMPORT boxes onto the canvas to import the raster channel(s) and classification training sample(s). Note that you can also access commonly used algorithms using your mouse: simply right click on the grey canvas area and choose “Common Modules”.

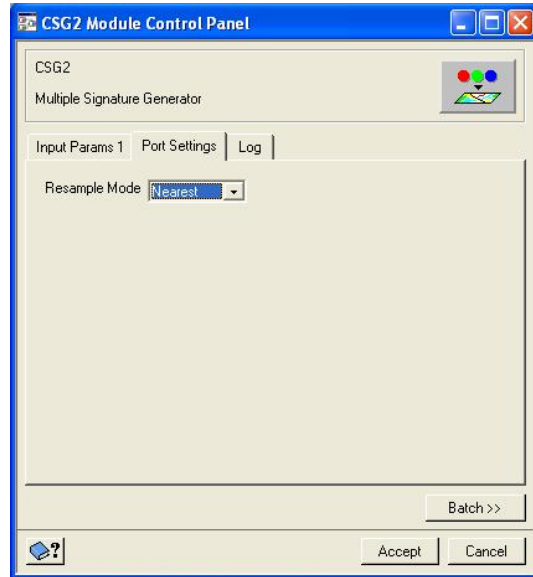
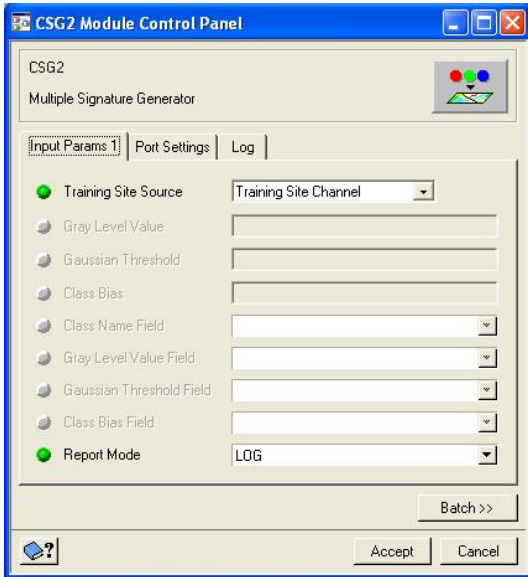
The demo data file (*I7_ms.pix*) used in this modeler example is available under Geomatica 10.3 install *C:\Program Files\PCI Geomatics\Geomatica_V103\demo\I7_ms.pix*.



Raster channel 7 of I7_ms.pix was created from 4 bitmap masks (Water, Urban, Vegetation and Open Land) using the MAP algorithm. It will be used as the training channel input for the CSG2 algorithm.

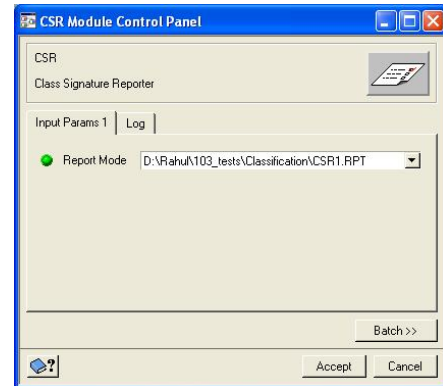
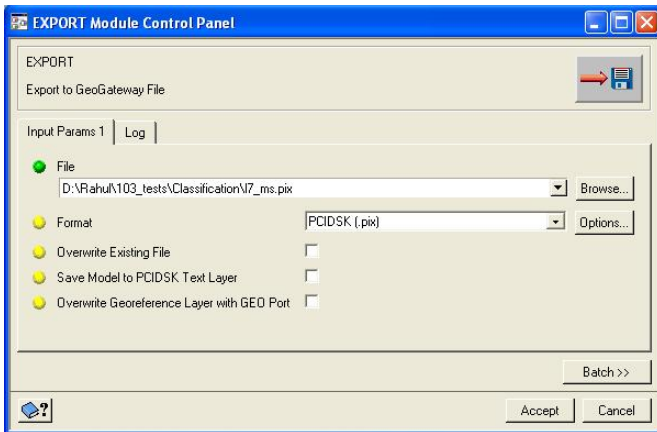
1.2 Multiple Signature Generator – CSG2

Multiple Signature Generator (CSG2) creates signatures for a particular window or region under a bitmap mask or vector polygon layer using data from a series of image channels. Each signature consists of channel mean values, deviations, thresholds, and relative "a priori" probabilities.



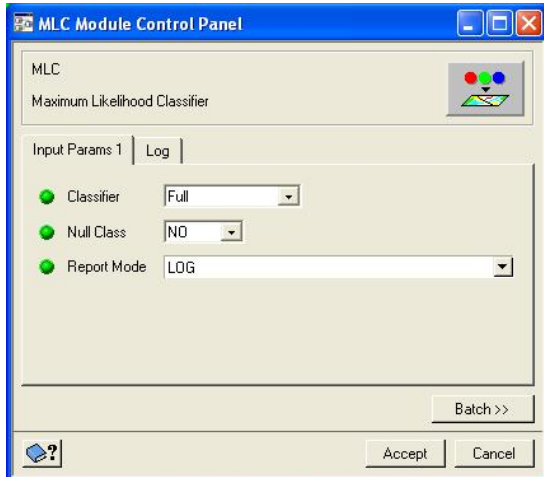
Since raster channel 7 is used as the training channel input for the CSG2 algorithm, 'Training Site Channel' is selected as the training site source in CSG2 input parameters. The default resampling mode 'Nearest' is used in this example.

The output of CSG2 is exported back to the input image (I7_ms.pix) using an Export module. Four independent detailed signature reports are also generated from CSG2 output. These reports can be used independently for analysis purposes.



1.3 Maximum Likelihood Classifier - MLC

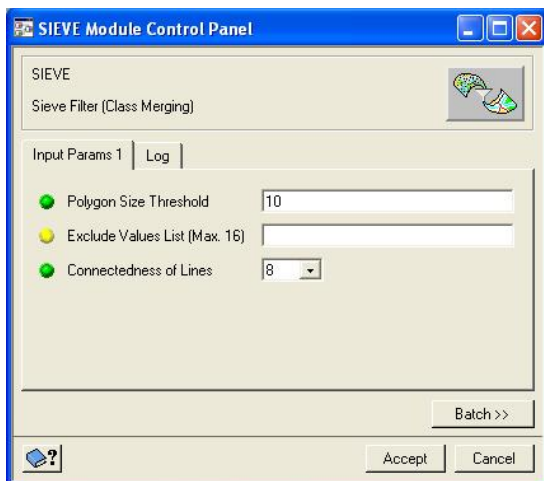
The inputs to the MLC algorithm are the unclassified image raster channels and signatures generated from CSG2. Select either one of 'Parallelepiped', 'Ties or Full' classifier and 'Null Class' value as Yes or No. MLC report will be generated in the form of a Log file.



The number of class signatures generated by CSG2 will determine the number of classes created by MLC in the output image layer.

1.4 SIEVE Filter

Sieve filter is a class merging algorithm. This program is used to remove small polygons from a classification. Sieve reads an image layer and merges 'polygons' smaller than a user specified threshold with the largest neighbouring polygon.



Select a 'Polygon Size Threshold' value. An 'Exclude Value List' can also be specified in Sieve. These pixel values will not be filtered from the MLC classified image. Select a 'Connectedness of Lines' value as 4 or 8 to determine if diagonal pixels are used to determine the polygon size. In a four connected polygon, pixels are considered adjacent if they are in contact horizontally or vertically. Eight connectedness also includes pixels in contact on the diagonal.

1.5 Results

The Sieve filtered classified image is exported in PIX file format using Export module. A Viewer module can also be placed in the Model to view the results instantly in Model Viewer.

A custom PCT can also be specified in the Export and Viewer modules.

