



Trimble eCognition Suite

for Windows operating system

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Trimble Documentation

eCognition 9.4

Release Notes

Imprint and Version

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Overview

1.1 About eCognition Suite

Trimble® eCognition® Suite is an advanced analysis software available for geospatial applications. It is designed to improve, accelerate and automate the interpretation of a variety of geospatial data and enables users to design feature extraction or change detection solutions to transform geospatial data into geo-information.

eCognition imports a variety of geospatial data, fusing them together into a rich stack of geo-data for the analysis. The analysis logic is structured into series of steps to create a computer-based representation of an expert's geospatial interpretation process a so called Rule Set. eCognition then combines the analysis logic with scalable computing power to identify changes over time or features on the earth's surface across very large sets of data.

eCognition Suite version 9.4 is a major release and includes a range of new features and bug fixes. We recommend upgrading to this new version to benefit from the new features and improvements. For an overview of the highlights please refer to chapter eCognition Suite 9.4 Highlights, page 5. A complete list of new features and bug fixes can be found in chapter New Features - Bug Fixes and Limitations, page 1.



1.2 Key Features

Building Analysis Solutions

The eCognition technology examines image pixels not in isolation, but in context. It builds up a picture iteratively, recognizing groups of pixels as objects. Just like the human mind, it uses color, shape, texture, shape and size of objects, as well as their context and relationships, to draw the same conclusions that an experienced analyst would draw.

To build an analysis solution, it is possible to flexibly combine the image interpretation steps like object creation (segmentation), object classification (knowledge based, fuzzy logic, machine learning), object detection (template matching) and object modification (fusing, smoothing, orthogonalization, simplification) into a Rule Set or even a new application (Rule Set with UI) to solve the analysis problem.

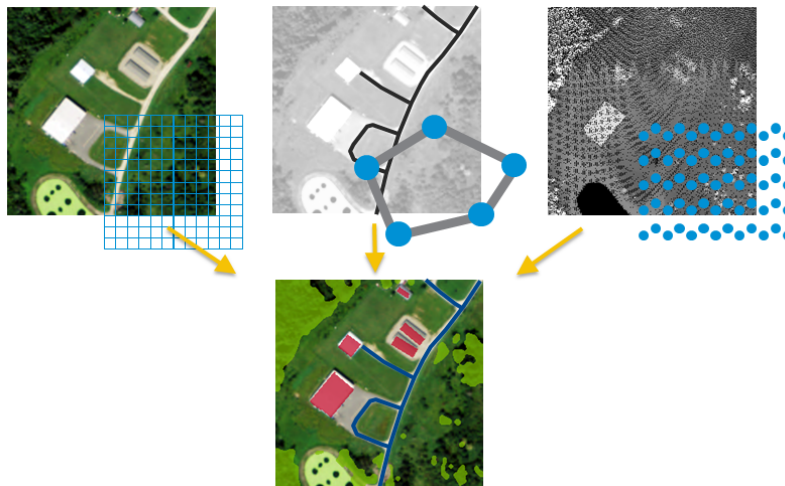
The result is a unique approach to translate mind models (why a human interpreter can see the objects, changes, or features in the geospatial data) into computer understandable code (Rule Set) or an individual/customized application.



Leveraging Data Synergies

eCognition can fuse a variety of geospatial data, such as spectral image data, 3D structure data from point clouds and spatial/thematic data from GIS vectors.

The proximity of eCognition to GIS, its ability to link and fuse the available data in an analysis - combined with the straightforward export of results to GIS layers - help eCognition users to achieve outstanding results.

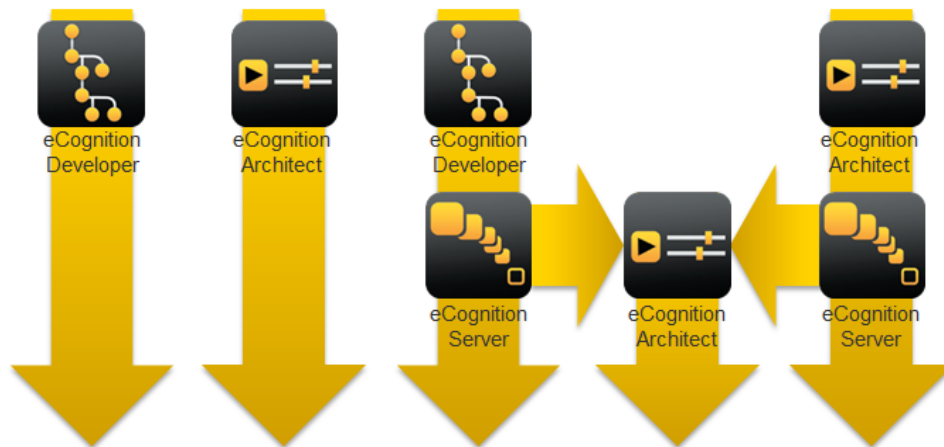


Efficient Workflows

The eCognition Suite offers three different components which can be used stand-alone or in combination to solve even the most challenging fully automated and semi-automated production tasks:

- eCognition Developer is the development environment for object-based image analysis. It is used in geospatial industry to develop Rule Sets or applications for eCognition Architect for the automatic analysis of geospatial data.

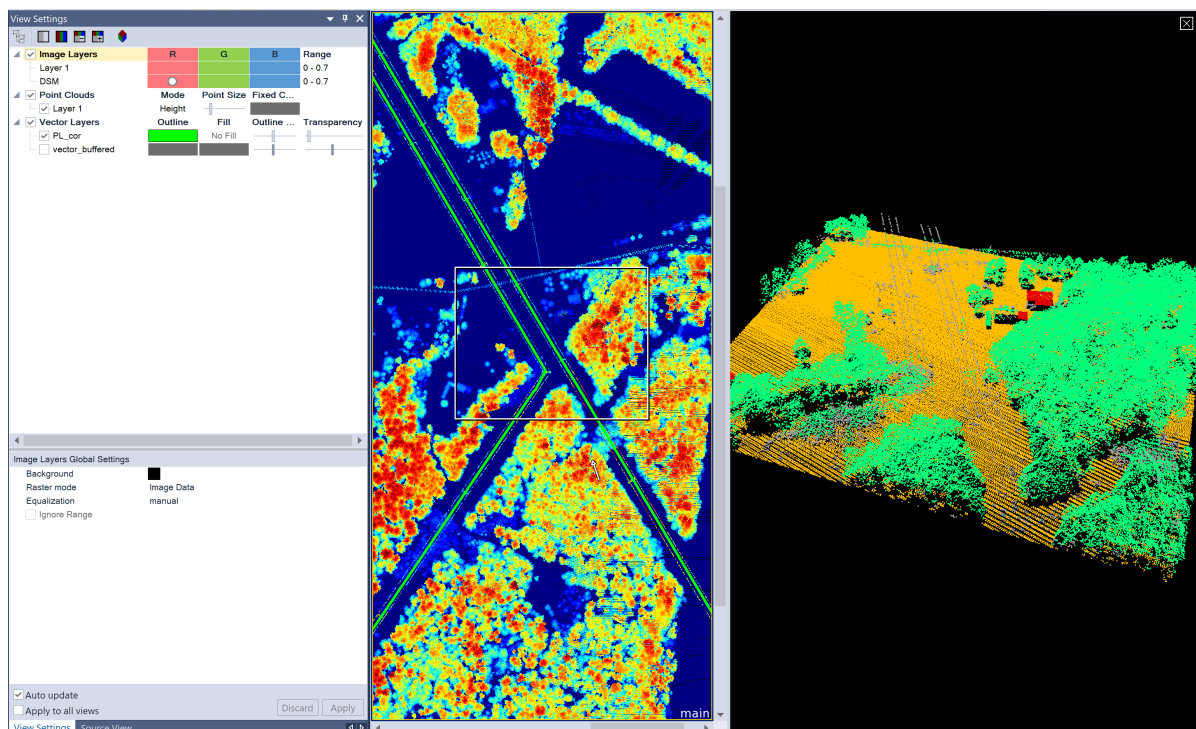
- eCognition Architect enables non-technical professionals such as vegetation mapping experts, urban planners or foresters to leverage eCognition technology. Users can easily configure, calibrate and execute analysis applications (Rule Set in combination with a UI) created in eCognition Developer.
- eCognition Server software provides a powerful processing environment for batch and parallel execution of analysis jobs, based on Rule Sets or applications.



1.3 eCognition Suite 9.4 Highlights

1.3.1 Improved UI Efficiency

eCognition Suite 9.4 includes a number of user interface improvements that are designed to make general software use easier and rule set development quicker by making tools more efficient. User can now utilize the View Setting and Source View windows to quickly populate and configure projects with eCognition Developer. The View Setting window and tools puts data visualization in a single, easy to access, location to better support data fusion for projects that combine image, vector and point cloud data. The Source View window provides users a simple data management area to modify input layer alias, display orders and access information on file details.



In addition, users can now efficiently search the wide array of features available within the Feature View to quickly locate the feature needed for their project.

Furthermore, an HTML-based Help has been implemented for to fully support cross-document searches and the latest support material.

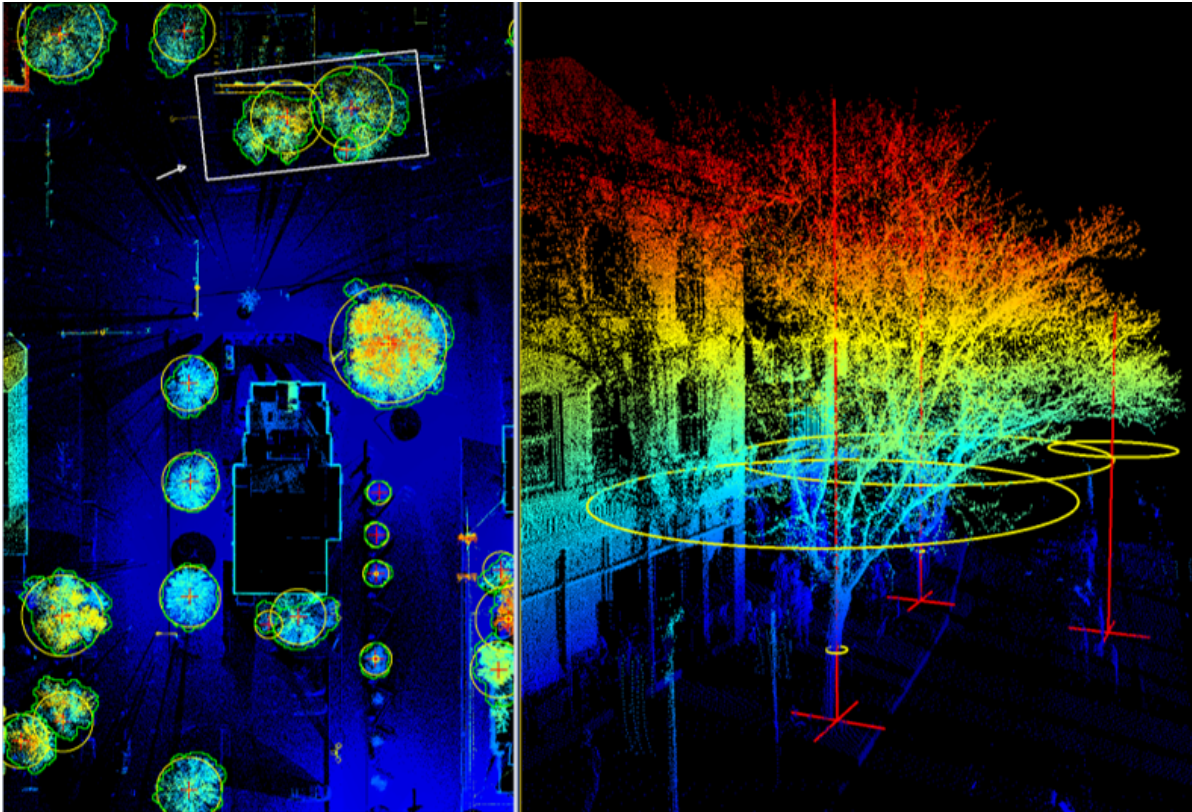
1.3.2 New Algorithms for Enhanced Usability

Version 9.4 includes a series of new algorithms that make rule set development easier for new and experienced users alike. These out-of-the-box algorithms and the creation of image objects from vector layers through a simple vector based segmentation.

A new segmentation algorithm is also available for the generation of homogeneous image objects based on the standard deviation of a raster layer.

1.3.3 Advanced 3D Visualization

The functionality of the 3D point cloud view has been extended to support 3D vector data. Now, point clouds and 3D vector layers can be viewed together to provide a full spatial understanding of point cloud features.



New Features - Bug Fixes and Limitations

2.1 New Features

New Features in eCognition 9.4.0:

Story	Feature	Description
Usability	New window: 'Source view'	Users can rename and reorder image layers, vector layers and point clouds, and access meta data.
Usability	Improved window: 'View settings'	View settings of image layers, vector layers, and point clouds can now be controlled from the 'view settings' window.
Usability	New tool: drag-and-drop of data	Projects can be created and modified via drag and drop of data.
Usability	New tool: drag-and-drop of workspaces	A workspace can be opened via drag and drop of a .dpj file.
Usability	New tool: drag-and-drop of rulesets	Rulesets can be added to the Process Tree via drag-and-drop (from Explorer).
Usability	New tool: reordering of layers with drag and drop	Users can change the order of vector and point cloud layers (which affects display order in viewer).
Usability	Improved functionality: vector outline width	The vector outline width can now be adjusted for each vector layer separately, using a slider.
Usability	New menu item: HTML help	Users can now access and search complete documentation online (Help > Online Help).
Usability	Improved dialog: select feature	A search box allows quick navigation to any feature, based on its name.

Usability	Improved behavior: zoom drop-down	The zoom level can now be edited to any user-defined value.
Usability	Improved tool: zoom	Users can now zoom in at subpixel level (useful for point clouds and vectors).
Usability	Improved dialog: system info	New entry for GPU CUDA info available.
3D vector visualization	Improved 3D viewer	Vectors can be displayed in the 3D viewer (which previously displayed only point clouds).
3D vector visualization	Improved vector analysis	All vector analysis algorithms accept 3D vector input.
3D vector visualization	Improved vector analysis	Vector buffering, vector boolean (union), vector simplification, and convert vectors to lines or points maintain the elevation info when points, flat lines, or flat polygons are processed.
3D vector visualization	Improved vector analysis	The remaining vector algorithms will return flattened 2D vectors.
3D vector visualization	Modified algorithm: convert image objects to vector objects	Output vector objects can be assigned a fixed elevation (3rd dimension).
3D vector visualization	Modified algorithm: create thematic vector object	The algorithm can now be used to create 3d points and lines.
Basic algorithms	New algorithm: ndsm layer calculation	This algorithm creates an NDSM layer based on DSM and DTM layers.
Basic algorithms	New algorithm: index layer calculation	This algorithm generates common index layers, e.g. NDVI (vegetation), NDSI (soil), NDWI (water) etc.
Basic algorithms	New algorithm: stddev split segmentation	This algorithm creates homogeneous image objects based the standard deviation of a raster layer.
Basic algorithms	New algorithm: vector-based segmentation (replaces algorithm 'synchronize image object	Users can create or modify an image object level based on vector objects in a thematic layer, or cut existing image objects based on the thematic layer.

	hierarchy')	
Deep learning	Improved performance	GPU support for deep learning algorithms now also available for Linux operating systems.
Image analysis	Library upgrade	OpenCV based algorithms now use OpenCV version 3.4.1.
Point cloud analysis	Improved export: point clouds	Software name and .las version are now written in the header.

2.2 Bug Fixes

The update includes the usual bug fixes and improved performance and system stability.

Bug Fixes in 9.4.0:

Reference	Description
ECOG-1486	Complex FileGDBs are not recognized
ECOG-4588	No point is visualized in point cloud viewer when very small subset is selected
ECOG-4878	Multiple object selection with shift key not working for manual editing
ECOG-4903	Point cloud display with RGB mode does not always show correct colors
ECOG-4904	Image layer setting 'ignore values' doesn't work as expected
ECOG-4934	Point cloud sometimes disappears from viewer during ruleset processing
ECOG-4990	Assign class to PC algo with object features doesn't work
ECOG-5006	Manual classification tool in action library not immediately editable
ECOG-5007	Point clouds are sometimes displayed with incorrect height rendering, and rotated around an inappropriate center
ECOG-5042	Crash when importing many .las at once
ECOG-5056	Crash when using manual editing > merge thematic object based on image object > merge to polygon
ECOG-5091	TensorFlow GPU support is missing in trial version
ECOG-5112	Algorithm 'fill pixel values' with linear interpolation computes wrong value for pixels in Y axis
ECOG-5131	Background color in 'View Settings' doesn't work as expected
ECOG-5147	Installing or uninstalling the client fails with message 'a running client

	process was found'
ECOG-5191	Brush tool sometimes barely visible (poor contrast to image)
ECOG-5193	Customized import fails when using {frame}
ECOG-5196	Click-and-drag not working for area zoom
ECOG-5298	Multiresolution segmentation unstable when working with multiple cores
ECOG-5335	Algorithm 'rename map' does not transfer layer aliases correctly
ECOG-5350	Algorithm 'pixel-based object resizing' unstable on large scenes
ECOG-5385	Instability after merging when one or more image objects are marked as samples

2.3 Known Issues and Limitations

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[gdal/frmts/gtiff/tif_float.c](#)

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[gdal/frmts/hdf4/hdf-eos/*](#)

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[gdal/frmts/pcraster/libcsf](#)

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[gdal/frmts/grib/degrib/*](#)

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[gdal/ogr/ogrsf_frmts/dxf/intronurbs.cpp](#)

This code is derived from the code associated with the book "An Introduction to NURBS" by David F. Rogers. More information on the book and the code is available at:

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[gdal/alg/thinplatespline.cpp](#)

IEEE754 log() code derived from:

@(#)e_log.c 1.3 95/01/18

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[gdal/alg/libqhull](#)

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[gdal/frmts/pdf/pdfdataset.cpp \(method PDFiumRenderPageBitmap\(\)\)](#)

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Contacts

There are two mailing lists related to FreeType:

o freetype@nongnu.org

Discusses general use and applications of FreeType, as well as future and wanted additions to the library and distribution. If you are looking for support, start in this list if you haven't found anything to help you in the documentation.

o freetype-devel@nongnu.org

Discusses bugs, as well as engine internals, design issues, specific licenses, porting, etc. Our home page can be found at <http://www.freetype.org>

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The Unix configuration script "configure" was produced with GNU Autoconf.

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The same holds for its supporting scripts (config.guess, config.sub, ltconfig, ltmain.sh). Another support script, install-sh, is copyright by M.I.T. but is also freely distributable.

It appears that the arithmetic coding option of the JPEG spec is covered by patents owned by IBM, AT&T, and Mitsubishi. Hence arithmetic coding cannot legally be used without obtaining one or more licenses. For this reason, support for arithmetic coding has been removed from the free JPEG software. (Since arithmetic coding provides only a marginal gain over the unpatented Huffman mode, it is unlikely that very many implementations will support it.)

So far as we are aware, there are no patent restrictions on the remaining code. The IJG distribution formerly included code to read and write GIF files.

To avoid entanglement with the Unisys LZW patent, GIF reading support has been removed altogether, and the GIF writer has been simplified to produce "uncompressed GIFs". This technique does not use the LZW algorithm; the resulting GIF files are larger than usual, but are readable by all standard GIF decoders.

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