

Release Notes

Trimble eCognition Suite

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Trimble Documentation

eCognition 10.4

Release Notes

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Portions of this product are based in part on third-party software components.

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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.

This eCognition Suite 10.4 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 and a complete list of new features and bug fixes please refer to the following chapters.

1.2 Key Features

1.2.1 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.

1.2.2 Leveraging Data Synergies

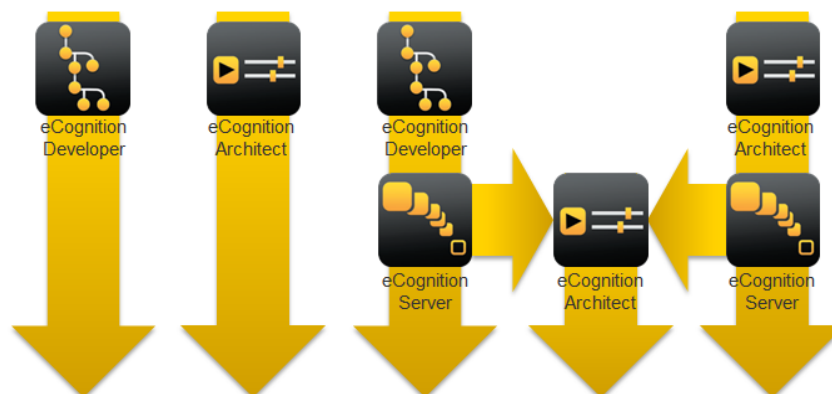
eCognition can fuse a variety of geospatial data, such as spectral image data, 3D structure data from point clouds and spatial/thematic data from GIS vectors.

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.

1.2.3 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:

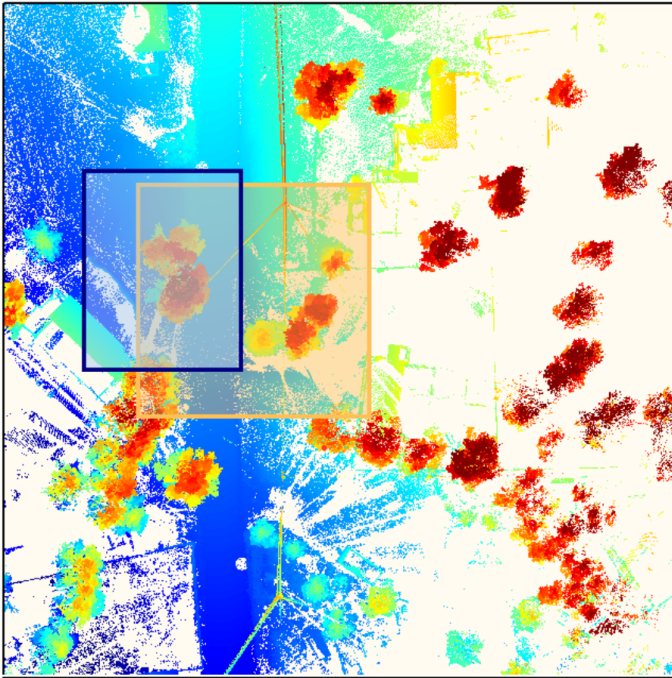
- eCognition Developer is the development environment for object-based image analysis. It is used in geospatial industry to develop Rule Sets or applications for eCognition Architect for the automatic analysis of geospatial data.
- eCognition Architect enables non-technical professionals such as vegetation 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 10.4 Highlights

1.3.1 Region Visualization

Regions have been extensively utilized by eCognition users to focus on specific areas of the complete image. However after creating a region a user was not able to visualize its boundaries. eCognition 10.4 offers region visualization which remove any accessibility issues.



Region Visualization

1.3.2 Full Python Integration: Embedded Python and External API

Following the successful first step in Python Integration in eCognition 10.3, we move forward and offer more capabilities that will enable seamless fusion of eCognition rule set and Python. eCognition 10.4 offers external Python API to allow execution of rulesets (*.dcp) directly in Python. See User Guide > Python Package Documentation. Available only for users with a valid eCognition Server license.

```
import ecognitionapi as ecog
import os

# control logging level: "Nothing" / "Basic" / "Detailed" / "Everything"
os.environ["ECOG_CONFIG_logging"]="trace level=Basic"

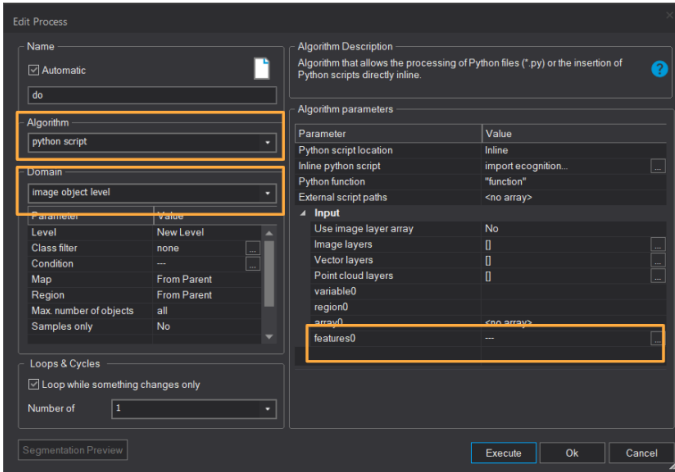
def array_example():
    """
    This example demonstrates how to pass array parameters to rule set
    and how to retrieve result array after analysis is finished
    """
    print("-----")
    print(f"Example: how to set input array parameter and get output array from the ruleset.")

    # create eCognition API
    with ecog.EcognitionApi(log_file_path=os.path.abspath("logs/engine.log"), license_server="@localhost") as ecogApi:
        # load rule set
        ecogApi.load_ruleset(os.path.abspath("rulesets/arrays.dcp"))
        # add image
        ecogApi.add_image(img_path = os.path.abspath("data/Landast.tif"))
        # create a project
        ecogApi.create_project()
```

Python Wheel Package - External API

1 Overview

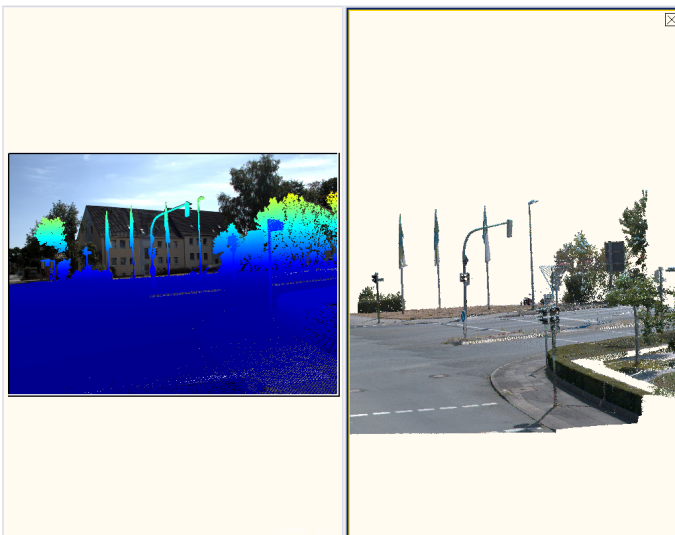
Additionally, for those who have been using our embedded Python, the algorithm 'python script' now supports image objects domain and image object features. For more information please refer to Reference Book > Algorithms > Miscellaneous > Embedded Python API



Python script algorithm - Image objects support and image object features support

1.3.3 Mobile Mapping Data Support - Camera View

With the rise of mobile mapping in geospatial world, eCognition is equipped with the tools for convenient visualization and processing of complex data sets that comprise of images and point clouds. For more information on how to use this new functionality please refer to User Guide > Working with Mobile Mapping Data.



Mobile Mapping Data Support

New Features - Bug Fixes and Limitations

2.1 New Features

New Features in eCognition 10.4.0:

Python Integration

Support of image objects and features	Image objects and their features are a fundamental concept of data analysis in eCognition. Now when creating a Python script, users can process not only pixels, but they can also access image object domain and of course eCognition's rich feature library.
External Python API	With Python remaining the most popular programming language in the geospatial world, we have created an eCognition wheel package that will allow to deploy eCognition rule sets (.dcp files) in Python scripts.

Region Visualization

Regions in the View Settings	View Settings window has a new node called Regions, where all created regions are listed and where the visibility of each individual 2D or 3D region can be toggled. Additionally, users can set individual thickness and color for each region. Option to zoom to specific region is available in the context menu. Option to edit a region is available in the context menu.
Drawing a region	Users can now draw a region. This option is available in the window 'Create region variable' and in the context menu.

Mobile Mapping Data Support

Load Data	Trimble eCognition 10.4 supports datasets from Trimble MX9 and MX50. TMX export from TBC is supported.
Visualize Data	eCognition supports synchronized visualization of imagery and point clouds. Users can easily navigate through stations using a new toolbar. When navigating through images, only a point cloud relevant to the current image content is displayed.
New Features	Besides imagery and point clouds mobile mapping data also contains a trajectory which is very often utilized when extracting information. New map features Camera position X/Y/Z allow to access trajectory information.

New Algorithm	New algorithm 'create top-down map' allows to easily map results of analysis based on mobile mapping imagery to point cloud.
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Machine Learning

Object-based cluster analysis	Unsupervised classification now supports a new object feature based clustering mode which applies cluster analysis based on existing image objects, and cluster calculation is based on the selected image object feature.
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Improvements

New parameter in 'export supervised sample statistics' algorithm	In the 'export supervised sample statistics' algorithm (section Classification) a new parameter 'Export mode' allows a user to choose between overwriting the existing sample statistics table or appending to the existing.
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Improved performance when working with point clouds	New option in Tools menu (by default) restricts point cloud properties to x, y, z, intensity and RGB. This option delivers speed and memory boost.
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New parameters in vector conversion algorithms	Algorithms 'convert polygon/line vectors to point vectors' and 'convert polygon vectors to line vectors' (section Thematic Layer Operations) have a new parameter 'Hole attribute' which allows users to add a column to the attribute table. The value in the column will indicate for each point / line whether it belongs to polygon outline points or to inner ring.
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Enhanced "delete layer" algorithm	The algorithm 'delete layer' (section Image Layer Operations) can now delete multiple layers.
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Enhancements for Image Object Information window	Now users can hide all the features in the Image Object Information window with the new context menu option 'Clear All Features'.
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2.2 Bug Fixes

Bug Fixes and Improvements in 10.4.0:

Bug Fixes	
Bug Fix	Feature range toolbar visibility: the feature range tool bar only appeared when the Feature View window was stretched out.
Bug Fix	Behavior of the Help icon button in the Edit Process window: issues with the visualization of the Help icon button that occurred when the Edit Process window was resized have been fixed.
Bug Fix	Duplicate class filter in the 'remove classification' algorithm: algorithm 'remove classification' had two class filters , one in the Domain group box and another in the Algorithm parameters. The parameter was removed from the Algorithm parameters. Backward compatibility is ensured.
Bug Fix	Visualization issue in the Template editor window: in the Test Template tab templates were not highlighted. This issue has been fixed.
Bug Fix	eCognition flips images: sometimes images were flipped when imported to eCognition. This did not happen in other software packages. eCognition assumed that the geocoding origin was always at the bottom left corner. The issue has been fixed.
Bug Fix	Empty Importance Feature Array: after training and applying a supervised classification, the query function was not writing anything to the Importance Feature Array. The export importance table did not work either.
Bug Fix	Customized Import does not recognize file directory names automatically when entering a second file with a different naming than the master file. This issue has been fixed.