

RELEASE NOTES

Trimble eCognition Suite

for Windows operating system

Version 9.4.0
Revision 1.0
November 2018

Trimble Documentation

eCognition 9.4

Release Notes

Imprint and Version

Document Version 9.4.0

Copyright © 2018 Trimble Germany GmbH. All rights reserved. This document may be copied and printed only in accordance with the terms of the Frame License Agreement for End Users of the related eCognition software.

Published by:

Trimble Germany GmbH, Arnulfstrasse 126,
D-80636 Munich, Germany

Phone: +49-89-8905-710;

Fax: +49-89-8905-71411

Web: www.eCognition.com

Dear User,

Thank you for using eCognition software. We appreciate being of service to you with image analysis solutions. At Trimble we constantly strive to improve our products. We therefore appreciate all comments and suggestions for improvements concerning our software, training, and documentation. Feel free to contact us via the web form on www.eCognition.com/support. Thank you.

Legal Notes

Trimble® and eCognition® are registered trademarks of Trimble Germany GmbH in Germany and other countries. All other product names, company names, and brand

names mentioned in this document may be trademark properties of their respective holders.

Protected by patents EP0858051; WO0145033; WO2004036337; US 6,832,002; US 7,437,004; US 7,574,053 B2; US 7,146,380; US 7,467,159 B; US 7,873,223; US 7,801,361 B2.

Acknowledgments

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

eCognition Developer © 2018 Trimble Germany GmbH, Arnulfstrasse 126, 80636 Munich, Germany. All rights reserved. © 2018 Trimble Documentation, Munich, Germany.

Last updated: November 6th, 2018

Contents

| | |
|--|-----------|
| 1 Overview | 1 |
| 1.1 About eCognition Suite | 1 |
| 1.2 Key Features | 2 |
| 1.3 eCognition Suite 9.4 Highlights | 5 |
| 1.3.1 Improved UI Efficiency | 5 |
| 1.3.2 New Algorithms for Enhanced Usability | 5 |
| 1.3.3 Advanced 3D Visualization | 6 |
| 2 New Features - Bug Fixes and Limitations | 7 |
| 2.1 New Features | 7 |
| 2.2 Bug Fixes | 9 |
| 2.3 Known Issues and Limitations | 10 |
| 3 Acknowledgments | 11 |
| 3.1 Geospatial Data Abstraction Library (GDAL) Copyright | 11 |
| 3.1.1 GDAL/OGR Licensing | 11 |
| 3.2 Freetype Project License | 18 |
| 3.2.1 Introduction | 18 |
| 3.2.2 Legal Terms | 18 |
| 3.3 Libjpg License | 20 |

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.

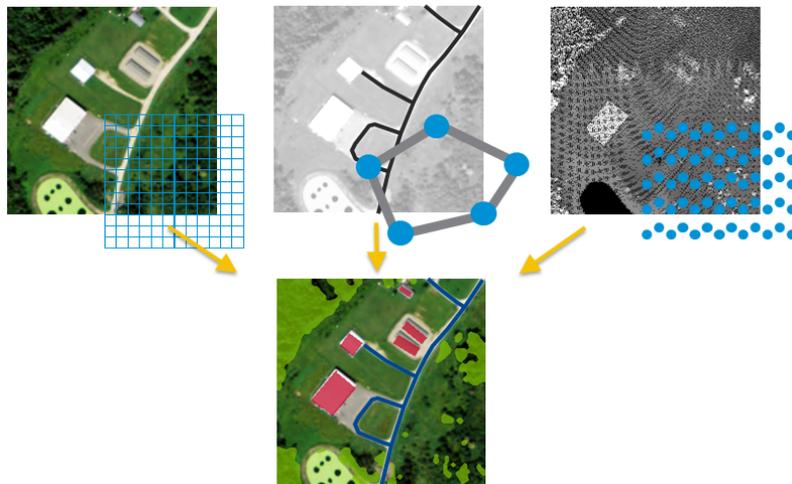
The result is a unique approach to translate mind models (why a human interpreter can see the objects, changes, or features in the geospatial data) into computer understandable code (Rule Set) or an individual/customized application.



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.

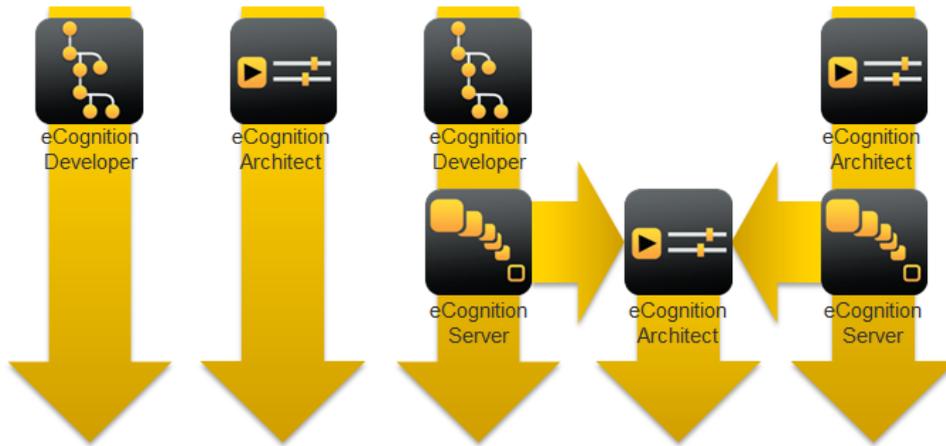


Efficient Workflows

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.

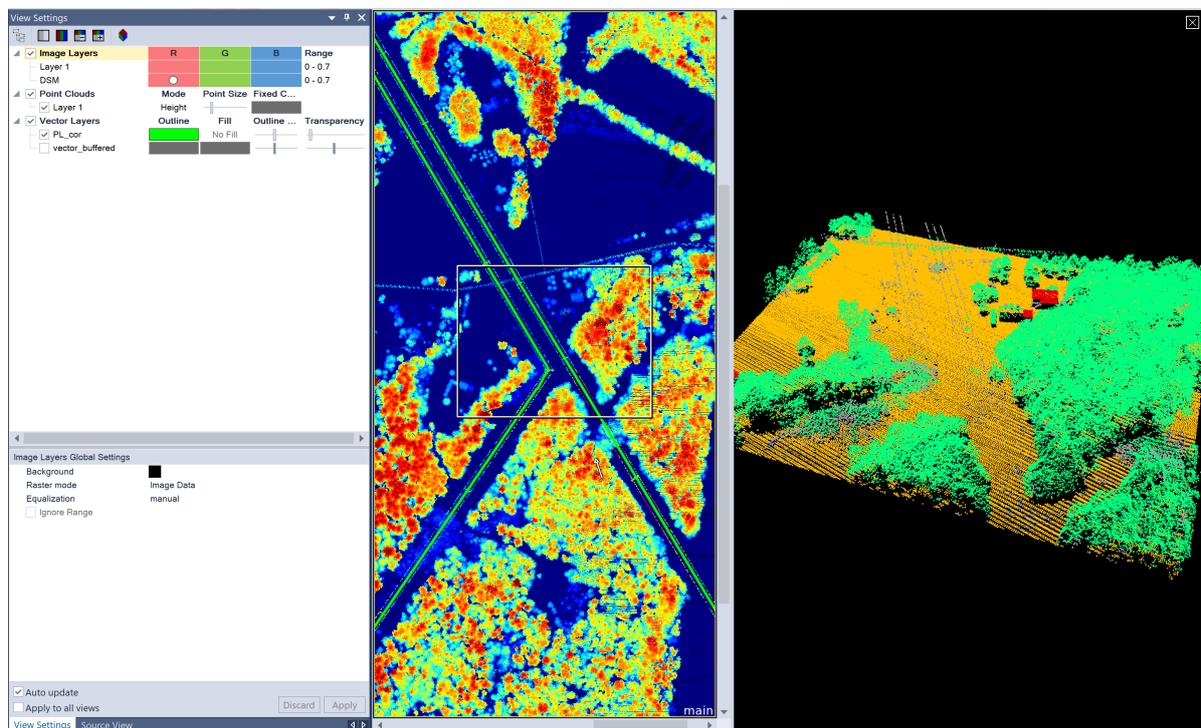
- eCognition Architect enables non-technical professionals such as vegetation mapping experts, urban planners or foresters to leverage eCognition technology. Users can easily configure, calibrate and execute analysis applications (Rule Set in combination with a UI) created in eCognition Developer.
- 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.

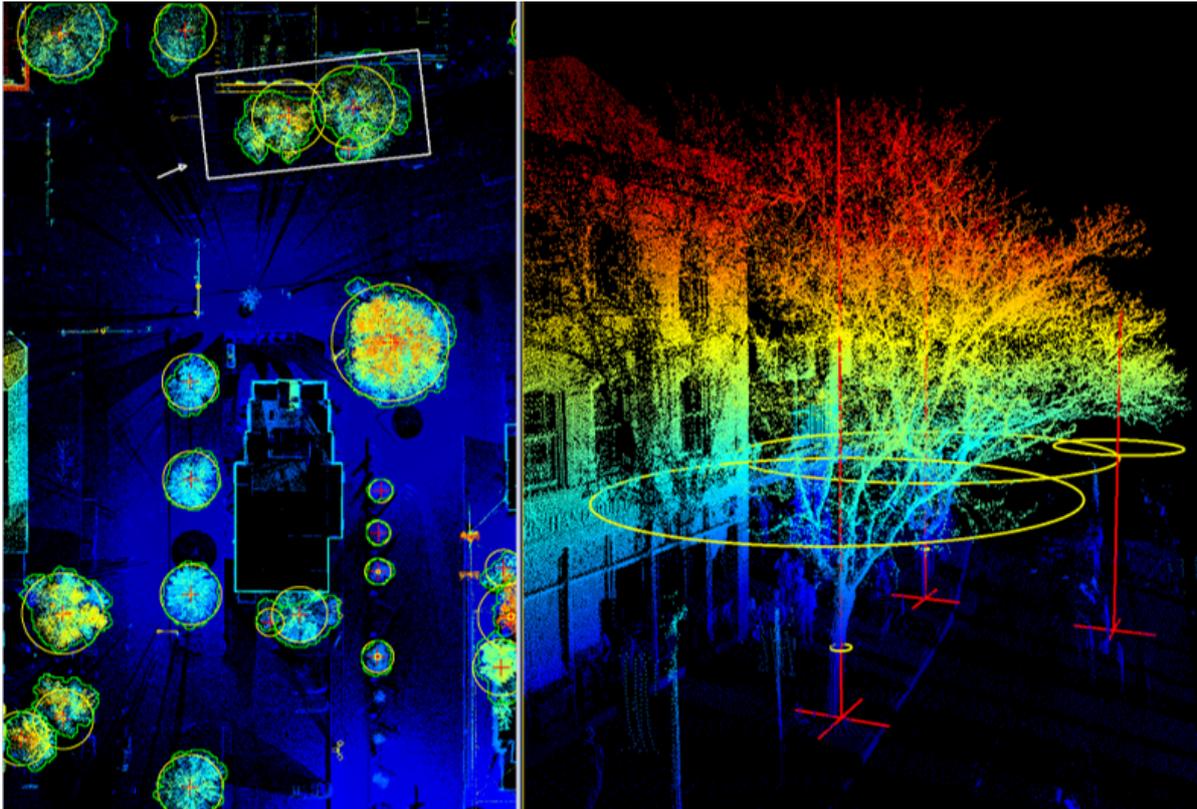
1.3.2 New Algorithms for Enhanced Usability

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

Prior to installing the eCognition License Server version 9.4 users should return all licenses and uninstall previous versions of the License Server. All 9.4 products require the eCognition License Server version 9.4 to work. Please contact support if you have further questions.

Acknowledgments

Portions of this product are based in part on the third-party software components. Trimble is required to include the following text, with software and distributions.

3.1 Geospatial Data Abstraction Library (GDAL) Copyright

3.1.1 GDAL/OGR Licensing

This file attempts to include all licenses that apply within the GDAL/OGR source tree, in particular any that are supposed to be exposed to the end user for credit requirements for instance. The contents of this file can be displayed from GDAL commandline utilities using the `--license` commandline switch.

GDAL/OGR General

In general GDAL/OGR is licensed under an MIT/X style license with the following terms:

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions: The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

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

Copyright (c) 2002, Industrial Light & Magic, a division of Lucas

Digital Ltd. LLC

All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

- * Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
- * Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
- * Neither the name of Industrial Light & Magic nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

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

Copyright (C) 1996 Hughes and Applied Research Corporation

Permission to use, modify, and distribute this software and its documentation for any purpose without fee is hereby granted, provided that the above copyright notice appear in all copies and that both that copyright notice and this permission notice appear in supporting documentation.

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

Copyright (c) 1997-2003, Utrecht University

All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

- * Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
- * Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

* Neither the name of Utrecht University nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

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

The degrib and g2clib source code are modified versions of code produced by NOAA NWS and are in the public domain subject to the following restrictions:

<http://www.weather.gov/im/softa.htm>

DISCLAIMER The United States Government makes no warranty, expressed or implied, as to the usefulness of the software and documentation for any purpose. The U.S. Government, its instrumentalities, officers, employees, and agents assumes no responsibility (1) for the use of the software and documentation listed below, or (2) to provide technical support to users.

<http://www.weather.gov/disclaimer.php>

The information on government servers are in the public domain, unless specifically annotated otherwise, and may be used freely by the public so long as you do not 1) claim it is your own (e.g. by claiming copyright for NWS information -- see below), 2) use it in a manner that implies an endorsement or affiliation with NOAA/NWS, or 3) modify it in content and then present it as official government material. You also cannot present information of your own in a way that makes it appear to be official government information.

The user assumes the entire risk related to its use of this data. NWS is providing this data "as is," and NWS disclaims any and all warranties, whether express or implied, including (without limitation) any implied warranties of merchantability or fitness for a particular purpose. In no event will NWS be liable to you or to any third party for any direct, indirect, incidental, consequential, special or exemplary damages or lost profit resulting from any use or misuse of this data.

As required by 17 U.S.C. 403, third parties producing copyrighted works consisting predominantly of the material appearing in NWS Web pages must provide notice with such work(s) identifying the NWS material incorporated and stating that such material is not subject to copyright protection.

port/cpl_minizip*

This is version 2005-Feb-10 of the Info-ZIP copyright and license.

The definitive version of this document should be available at <ftp://ftp.info-zip.org/pub/infozip/license.html> indefinitely.

Copyright (c) 1990-2005 Info-ZIP. All rights reserved.

For the purposes of this copyright and license, "Info-ZIP" is defined as the following set of individuals:

Mark Adler, John Bush, Karl Davis, Harald Denker, Jean-Michel Dubois, Jean-loup Gailly, Hunter Goatley, Ed Gordon, Ian Gorman, Chris Herborth, Dirk Haase, Greg Hartwig, Robert Heath, Jonathan Hudson, Paul Kienitz, David Kirschbaum, Johnny Lee, Onno van der Linden, Igor Mandrichenko, Steve P. Miller, Sergio Monesi, Keith Owens, George Petrov, Greg Roelofs, Kai Uwe Rommel, Steve Salisbury, Dave Smith, Steven M. Schweda, Christian Spieler, Cosmin Truta, Antoine Verheijen, Paul von Behren, Rich Wales, Mike White

This software is provided "as is," without warranty of any kind, express or implied. In no event shall Info-ZIP or its contributors be held liable for any direct, indirect, incidental, special or consequential damages arising out of the use of or inability to use this software.

Permission is granted to anyone to use this software for any purpose, including commercial applications, and to alter it and redistribute it freely, subject to the following restrictions:

1. Redistributions of source code must retain the above copyright notice, definition, disclaimer, and this list of conditions.
2. Redistributions in binary form (compiled executables) must reproduce the above copyright notice, definition, disclaimer, and this list of conditions in documentation and/or other materials provided with the distribution. The sole exception to this condition is redistribution of a standard UnZipSFX binary (including SFXWiz) as part of a self-extracting archive; that is permitted without inclusion of this the binary or disabled.
3. Altered versions--including, but not limited to, ports to new operating systems, existing ports with new graphical interfaces, and dynamic, shared, or static library versions--must be plainly marked as such and must not be misrepresented as being the original source. Such altered versions also must not be misrepresented as being Info-ZIP releases--including, but not limited to, labeling of the altered versions with the names "Info-ZIP" (or any variation thereof, including, but not limited to, different capitalizations), "Pocket UnZip," "WiZ" or "MacZip" without the explicit permission of Info-ZIP. Such altered versions are further prohibited from misrepresentative use of the Zip-Bugs or Info-ZIP e-mail addresses or of the Info-ZIP URL(s).
4. Info-ZIP retains the right to use the names "Info-ZIP," "Zip," "UnZip," "UnZipSFX," "WiZ," "Pocket UnZip," "Pocket Zip," and "MacZip" for its own source and binary releases.

[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:

<http://www.nar-associates.com/nurbs/>

Copyright (c) 2009, David F. Rogers

All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

* Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.

* Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

* Neither the name of the David F. Rogers nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT HOLDER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

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

IEEE754 log() code derived from:

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

Copyright (C) 1993 by Sun Microsystems, Inc. All rights reserved.

Developed at SunSoft, a Sun Microsystems, Inc. business.

Permission to use, copy, modify, and distribute this software is freely granted, provided that this notice is preserved.

[gdal/alg/libqhull](#)

Only applies when GDAL is compiled with internal qhull support. Qhull, Copyright (c) 1993-2012

C.B. Barber, Arlington, MA and The National Science and Technology Research Center for Computation and Visualization of Geometric Structures (The Geometry Center), University of Minnesota, email: qhull@qhull.org

This software includes Qhull from C.B. Barber and The Geometry Center.

Qhull is copyrighted as noted above. Qhull is free software and may be obtained via http from www.qhull.org. It may be freely copied, modified, and redistributed under the following conditions:

1. All copyright notices must remain intact in all files.
2. A copy of this text file must be distributed along with any copies of Qhull that you redistribute; this includes copies that you have modified, or copies of programs or other software products that include Qhull.
3. If you modify Qhull, you must include a notice giving the name of the person performing the modification, the date of modification, and the reason for such modification.
4. When distributing modified versions of Qhull, or other software products that include Qhull, you must provide notice that the original source code may be obtained as noted above.
5. There is no warranty or other guarantee of fitness for Qhull, it is provided solely "as is". Bug reports or fixes may be sent to qhull_bug@qhull.org; the authors may or may not act on them as they desire.

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

Copyright 2014 PDFium Authors. All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

* Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.

* Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

* Neither the name of Google Inc. nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING

NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

gdal/frmts/mrf/* (apply when MRF driver included in build)

Copyright (c) 2002-2012, California Institute of Technology.

All rights reserved. Based on Government Sponsored Research under contracts NAS7-1407 and/or NAS7-03001.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. Neither the name of the California Institute of Technology (Caltech), its operating division the Jet Propulsion Laboratory (JPL), the National Aeronautics and Space Administration (NASA), nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE CALIFORNIA INSTITUTE OF TECHNOLOGY BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

Copyright 2014-2015 Esri

Licensed under the Apache License, Version 2.0 (the "License"); you may not use this file except in compliance with the License. You may obtain a copy of the License at <http://www.apache.org/licenses/LICENSE-2.0>

Unless required by applicable law or agreed to in writing, software distributed under the License is distributed on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied. See the License for the specific language governing permissions and limitations under the License.

3.2 Freetype Project License

Portions of this software are copyright © 2009 The FreeType Project (www.freetype.org). All rights reserved. Copyright 1996-2008, 2009 by David Turner, Robert Wilhelm, and Werner Lemberg

3.2.1 Introduction

The FreeType Project is distributed in several archive packages; some of them may contain, in addition to the FreeType font engine, various tools and contributions which rely on, or relate to, the FreeType Project. This license applies to all files found in such packages, and which do not fall under their own explicit license. The license affects thus the FreeType font engine, the test programs, documentation and makefiles, at the very least. This license was inspired by the BSD, Artistic, and IJG (Independent JPEG Group) licenses, which all encourage inclusion and use of free software in commercial and freeware products alike. As a consequence, its main points are that:

- o We don't promise that this software works. However, we will be interested in any kind of bug reports. (‘as is’ distribution)
- o You can use this software for whatever you want, in parts or full form, without having to pay us. (‘royalty-free’ usage)
- o You may not pretend that you wrote this software. If you use it, or only parts of it, in a program, you must acknowledge somewhere in your documentation that you have used the FreeType code. (‘credits’)

We specifically permit and encourage the inclusion of this software, with or without modifications, in commercial products.

We disclaim all warranties covering The FreeType Project and assume no liability related to The FreeType Project. Finally, many people asked us for a preferred form for a credit/disclaimer to use in compliance with this license. We thus encourage you to use the following text:

Portions of this software are copyright © 2009 The FreeType Project (www.freetype.org). All rights reserved.

3.2.2 Legal Terms

Definitions

Throughout this license, the terms ‘package’, ‘FreeType Project’, and ‘FreeType archive’ refer to the set of files originally distributed by the authors (David Turner, Robert Wilhelm, and Werner Lemberg) as the ‘FreeType Project’, be they named as alpha, beta or final release.

‘You’ refers to the licensee, or person using the project, where ‘using’ is a generic term including compiling the project's source code as well as linking it to form a ‘program’ or ‘executable’.

This program is referred to as ‘a program using the FreeType engine’. This license applies to all files distributed in the original FreeType Project, including all source code, binaries and

documentation, unless otherwise stated in the file in its original, unmodified form as distributed in the original archive. If you are unsure whether or not a particular file is covered by this license, you must contact us to verify this.

The FreeType Project is copyright (C) 1996-2009 by David Turner, Robert Wilhelm, and Werner Lemberg. All rights reserved except as specified below.

No Warranty

THE FREETYPE PROJECT IS PROVIDED `AS IS' WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT WILL ANY OF THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY DAMAGES CAUSED BY THE USE OR THE INABILITY TO USE, OF THE FREETYPE PROJECT.

Redistribution

This license grants a worldwide, royalty-free, perpetual and irrevocable right and license to use, execute, perform, compile, display, copy, create derivative works of, distribute and sublicense the FreeType Project (in both source and object code forms) and derivative works thereof for any purpose; and to authorize others to exercise some or all of the rights granted herein, subject to the following conditions:

- o Redistribution of source code must retain this license file (`FTL.TXT') unaltered; any additions, deletions or changes to the original files must be clearly indicated in accompanying documentation. The copyright notices of the unaltered, original files must be preserved in all copies of source files.
- o Redistribution in binary form must provide a disclaimer that states that the software is based in part of the work of the FreeType Team, in the distribution documentation. We also encourage you to put an URL to the FreeType web page in your documentation, though this isn't mandatory.

These conditions apply to any software derived from or based on the FreeType Project, not just the unmodified files. If you use our work, you must acknowledge us. However, no fee need be paid to us.

Advertising

Neither the FreeType authors and contributors nor you shall use the name of the other for commercial, advertising, or promotional purposes without specific prior written permission.

We suggest, but do not require, that you use one or more of the following phrases to refer to this software in your documentation or advertising materials: `FreeType Project', `FreeType Engine', `FreeType library', or `FreeType Distribution'.

As you have not signed this license, you are not required to accept it. However, as the FreeType Project is copyrighted material, only this license, or another one contracted with the authors, grants you the right to use, distribute, and modify it.

Therefore, by using, distributing, or modifying the FreeType Project, you indicate that you understand and accept all the terms of this license.

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>

3.3 Libjpg License

The authors make NO WARRANTY or representation, either express or implied, with respect to this software, its quality, accuracy, merchantability, or fitness for a particular purpose. This software is provided "AS IS", and you, its user, assume the entire risk as to its quality and accuracy.

This software is copyright (C) 1991-1998, Thomas G. Lane.

All Rights Reserved except as specified below.

Permission is hereby granted to use, copy, modify, and distribute this software (or portions thereof) for any purpose, without fee, subject to these conditions:

- (1) If any part of the source code for this software is distributed, then this README file must be included, with this copyright and no-warranty notice unaltered; and any additions, deletions, or changes to the original files must be clearly indicated in accompanying documentation.
- (2) If only executable code is distributed, then the accompanying documentation must state that "this software is based in part on the work of the Independent JPEG Group".
- (3) Permission for use of this software is granted only if the user accepts full responsibility for any undesirable consequences; the authors accept NO LIABILITY for damages of any kind.

These conditions apply to any software derived from or based on the IJG code, not just to the unmodified library. If you use our work, you ought to acknowledge us.

Permission is NOT granted for the use of any IJG author's name or company name in advertising or publicity relating to this software or products derived from it. This software may be referred to only as "the Independent JPEG Group's software".

We specifically permit and encourage the use of this software as the basis of commercial products, provided that all warranty or liability claims are assumed by the product vendor.

ansi2knr.c is included in this distribution by permission of L. Peter Deutsch, sole proprietor of its copyright holder, Aladdin Enterprises of Menlo Park, CA.

ansi2knr.c is NOT covered by the above copyright and conditions, but instead by the usual distribution terms of the Free Software Foundation; principally, that you must include source code if you redistribute it. (See the file ansi2knr.c for full details.) However, since ansi2knr.c is not needed as part of any program generated from the IJG code, this does not limit you more than the foregoing paragraphs do.

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

It is copyright by the Free Software Foundation but is freely distributable.

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.

We are required to state that "The Graphics Interchange Format(c) is the Copyright property of CompuServe Incorporated. GIF(sm) is a Service Mark property of CompuServe Incorporated."