



### OrthoVista V4.5.0

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### OrthoVista V4.5.0

#### New Feature: Windows 7 support

INPHO's photogrammetric software supports now the following Windows operating systems: Windows 7 (64bit only), Windows Vista (64bit only), Windows Server 2008 (64bit only), Windows Server 2003 (32 and 64bit) and Windows XP (32 and 64bit). Please note that this will be the last version being released for 32bit operating systems.

Windows 7 shows in general a performance increase of 5-10% compared with Windows Vista and about 30% compared with Windows XP.

#### New Feature: Common Project file handling between OrthoVista and Seam Editor

OrthoVista 4.5 and the Seam Editor 4.5 are now based on a new common project file format. It is based on a data base structure and is stored in a binary file. The new project file has the following advantages:

- Reopening a project allows a faster loading of all necessary information. Especially the Seam Editor can open projects much faster now.
- All necessary information for the processing is stored in one file
- The project file keeps information if a tile is edited or not. Allowing to easily selecting in OrthoVista the tiles that should be re-processed after editing.
- Unloading of images and tiles as well as loading of them is now possible
- A better selection of certain images in the Radiometrix Editor is possible
- Defining a Radiometrix Editor change on a small number of images and applying it on a larger number of images is possible by activating and deactivating images
- Images can be activated and deactivated and with it the image display and processing of images can be influenced

Upward compatibility of project and configuration files from previous versions (\*.ovp, \*.cfg) is supported. They can be still loaded and used for processing.

As the format of the project and configuration files is changed the new files do have new name extensions. The new project file has now the extension "ipd" and the new configuration file has the extension "scfg".

With the introduction of the new project file format the importance of configuration files is reduced. The configuration file contains now only global settings like the caching parameters and no more output file directories.

The generation of project and configuration files of previous versions (\*.ovp, \*.cfg) is supported as well.

#### New Feature: Project dialog in OrthoVista and Seam Editor

OrthoVista got now a project dialog window that is identical with the one in the Seam Editor. The project dialog shows orthophotos and tiles. It allows to



- Load and unload orthophotos and tiles
- Activate and deactivate them
- Sort them
- Change file paths
- Select and deselect images for the Radiometrix Editor
- Select and deselect edited tiles for the processing

With the new project dialog the so-far existing Clear All function is no more needed and necessary. Clear all is replaced with the “New Project” function.

### **New Feature: Handling of so-called INFO Files**

OrthoBox now supports the generation of an information file that can store details about the project, the processing parameters and the resulting orthophotos. The \*.info files are generated for every image on the output directory by OrthoMaster and are further on used by OrthoVista for the generation of info files for the tiles. User defined parameters can be added to the info file automatically.

### **New Feature: Handling of Region files**

Region files (\*.rgn) used to check for background pixels can and should be generated with OrthoMaster from version 5.2 on. They are stored by OrthoMaster on the orthophoto directory. OrthoVista is now checking for region files on the orthophoto directory and on the meta data directory when processing the images. If region files already exist OrthoVista has not to regenerate them which saves considerably time. OrthoMaster can generate the rgn files without any additional efforts with the orthophoto generation.

### **New Feature: Keep track of tiles modified in the Seam Editor**

With the new project file handling the Seam Editor marks internally modified tiles as edited. In OrthoVista it is now possible to sort edited tiles and easily select or deselect tiles for further processing.

### **New Feature: Exclude single images for processing**

With the new project file it is now possible to activate or deactivate single or several images. It is therefore possible to exclude single/several images from the processing by deactivating them.

### **New Feature: Application of radiometric corrections to a large number of images**

Radiometric curve corrections can now be defined for a subset of images and can then be applied to additional images. This is possible with the following procedure:

- Select some images
- Define Radiometrix Gradation Curve corrections for the images but do not apply them
- Select now all other images and the Radiometrix Editor will automatically change these images as well
- Apply the change



### **New Feature: Support of 12bit uncompressed images**

OrthoVista supports now also 12 bit uncompressed tiff images.

### **New Feature: Lite, Education; Demo Version**

OrthoVista is available in a Full, Lite, Education and Demo version. The Lite and Education versions are restricted to up to 250 photos in a frame based project, and 12 ADS images in a pushbroom project. Batch processing is not supported with this license. The demo version is not restricted to a certain number of images, does not need any license but writes irregular stripes into the output images and does not allow preparing jobs for a licensed version.

### **Change: Loading images in OrthoVista and Seam Editor**

To fasten up the loading time and display time of projects the following changes were introduced:

- If a new project is created in OrthoVista and images are loaded, the first 400 images are automatically set to active. The others are set to inactive. Only activated images are displayed and processed.
- If a new project is created in the Seam Editor, like in previous versions, no image is set active automatically.
- If a project file of the new format (ipd) is loaded the last saved situation concerning activated/deactivated images is loaded. OrthoVista and the Seam Editor are treated independently.

### **Change: Radiometrix Editor changes**

With the project dialog selections the user interface concerning selection/de-selection of images and zooming in/out was changed.

### **Change: Feature Detection algorithm improved**

The Feature Detection algorithm has been improved concerning the finding of seam lines with images having large overlap. Lesser small loops are detected and the seams are in general more straight where possible.

### **Change: Feature Detection – blurring effects**

The Feature Detection mode had in seldom cases problems with detecting correct seam lines. This was then leading either to ghosting effects (double blending of images) or to holes in the tiles. Problems were solved. However the Feature Detection method should still not be used for True-Orthophotos.

### **Change: Cache Size parameter settings on 64 bit operating systems**

The installation of the software is checking for 64 bit and 32 bit operating systems. If the software is installed on a 64 bit operating system the OrthoVista and Seam Editor Cache Size is set to 1024 MB. The large cache size can help in certain projects (large number of images or large rgn files) to speed up processing. If your 64 bit computer is equipped with **< 6 GB RAM** and you enable parallel processing for 4 jobs you should reduce the OrthoVista Cache size to 768 MB or install more RAM.



### Change: Tile Definition file - Simple Tile Definition Format

With former versions it was necessary to define with the simple tile definition the upper left and lower right corner. Now the two corners given are used to define a north oriented rectangle and it is no more important which corner is given. Important is to define two opposite corners.

### Change: Basic Mode no more supported

The Basic mode that allowed to call certain functions in OrthoVista with the 1, 2, 3 functions is no more available in OrthoVista.

### Change: DXF file import

The import of DXF files is stabilized and possible problems reported in the past with the DXF import are fixed.

### Information: Rotation direction of REGION, EXCLUSION, MOSAIC HINT files

The direction of rotation of REGION and EXCLUSION Polygons has to be considered if the Complex Polygon switch is off. If the Complex Polygon switch is on then the direction of rotation is not important as OrthoVista is doing a sophisticated checking of all polygons that might be quite time consuming. Complex Polygon has to be activated if polygons cut each other and shall be merged or build islands.

If Complex Polygon is deactivated then define a polygon counter-clockwise for areas to be excluded (e.g. water) and clockwise for areas to be included (e.g. islands).

Mosaic Hints do not consider islands within exclusions and therefore the direction of rotation is not important. All Polygons are treated as areas where seams should not go through (if possible).

### Information: Feature Detection requires a full set of overviews

It is very important that a full set of overviews is available for the images when the Feature Detection functionality is used. A full set of overviews is strongly recommended for a fast processing, because the Feature Detection accesses the second or third pyramid level.

### Information: Speeding up processing

To speed up processing certain parameter settings are leading to a more or less better performance. Please consider the following hints:

- Tiled TIFF image format of input and output images is in general faster than the Scanline TIFF format.
- In case of writing Tiled TIFF images the Tile Size plays an important role for the image writing speed. We suggest that you select a tile size that is similar to the tile size of the input images or half as large. With speed tests we detected the following:

Input: Images with tile size 1024	Processing speed difference
Output: Tiled TIFF – Tile Size 128	7 times slower
Output: Tiled TIFF – Tile Size 512	1.2 times faster
Output: Tiled TIFF – Tile Size 1024	1

Input: Images with tile size 256	Processing speed difference
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Output: Tiled TIFF – Tile Size 128	1.25 times faster
Output: Tiled TIFF – Tile Size 256	1
Output: Tiled TIFF – Tile Size 512	1.1 times slower
Output: Tiled TIFF – Tile Size 1024	2.6 times slower
Output: Scanline TIFF	2,7 times slower

- File IO speed is the most critical part of the orthophoto process. Therefore please make sure that your file IO is as fast as possible.

### Information: Scanline TIFF images

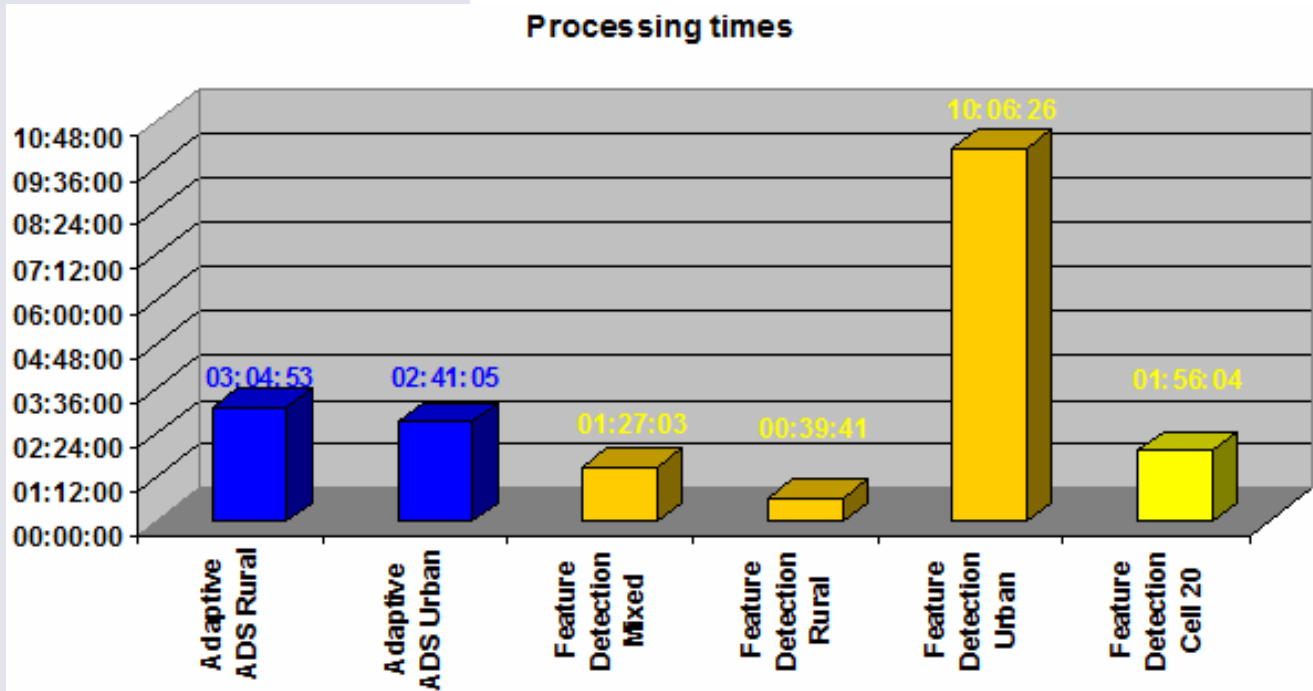
Scanline TIFF images are generally slower to access and write than tiled TIFF images. **Therefore we suggest using tiled TIFF images.**

The following table shows the time needed to compute just the region files (Background pixel detection) for different kind of file formats.

File type (Size of 8 bit image 375 MB)	Time for region generation in minutes
8 bit Tiled (Tile size 128x128)	3,5
16 bit Tiled (Tile size 128x128)	4,5
8 bit Tiled (Tile size 128x128) JPEG compressed	3,5
12 bit Tiled (Tile size 128x128) JPEG compressed	5
8 bit Scanline	5,5
16 bit Scanline	7,5
8 bit Scanline JPEG compressed	18
12 bit Scanline JPEG compressed	35
Image store with PhotoSHOP JPEG compressed	65

### Information: Automatic Seam finding times for ADS images

The following table compares the time in hours needed for processing three ADS image strips having a size of 16000\*220000 pixels each (35 GB) and an overlap of about 60% across the flight direction.



The table compares the Adaptive Feathering mode (blue) with the Feature Detection mode (yellow) and does contain the time needed for the seam line finding only.

One can see that Feature Detection Type Urban lasts about 5 times longer than the Adaptive Feathering mode. But the quality of the seams collected with the Feature Detection method is much better. Already Feature Detection of type Rural delivers better seams than Adaptive Feathering of Type Urban and is about 5 times faster than the Adaptive Feathering mode. A compromise being still fast and delivering a high quality is using the settings of Feature Detection Urban and modifying the cell size from 10 pixels to a cell size of 20 pixels.

#### **Information: Using Firewire, USB, ESATA drives**

When processing data on external drives then ESATA allows the highest file IO throughput. Dependent on the external drive and its connection it might be of advantage to use either the firewire or the USB connection. Please make own speed tests to check if a firewire or USB drive connection is faster.

#### **Information: Water Reflection Removal**

The option "Allow Complex Polygon Definition" allows skipping the import routine analysis. To skip this, the input polygon needs to fulfill two requirements:

- (1) The polygons must not be self-intersecting
- (2) The vertex order of the digitized polygons is important. We recommend digitizing the outer water area counter-clockwise and all islands clockwise.

If the polygon definition does not satisfy both requirements, the flag "Allow Complex Polygon Definition" must be set.

Please read the manual for more detailed information.



### Information: Handling ADS40 images

ADS40 images have the characteristic of being very large and very long strip wise. To process ADS40 images, it is very useful to increase the cache size of OrthoVista. We have made the following speed test with the following data set:



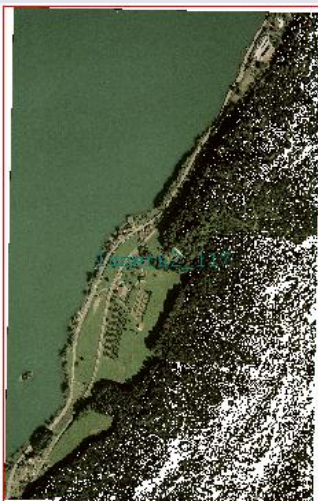
Block of two images with 79440x7952 and 86586x12579 pixels.

The whole block was processed using Global Tilting Adjustment and Adaptive Feathering with a different Cache Size on a 2.4 GHz processor with 2 GB RAM. The results are as follows:

Cache Size: 128 MB	→	Processing Time: 33 hours 11 min
Cache Size: 256 MB	→	Processing Time: 1 hour 56 min
Cache Size: 512 MB	→	Processing Time: 1 hour 56 min

### Information: Seam output

In order to generate DXF files containing either all automatically generated project-wide seams or single seams, OrthoVista must take into account all areas that contain background information. In circumstance where images contain numerous small and isolated areas with background pixels, the seam generation process can easily run out of memory.



**Note:** When the orthophotos are generated with OrthoMaster, the program automatically ensures that within the valid image area no black pixels are generated. Therefore no small and isolated areas will be later on in the Images. In case the orthophotos are generated with third party software, you might get the above described behavior. An example for an image with a large number of background pixels, here displayed in white, can be seen on the left side. The image contains a forest and was scanned with parameters causing the forest to contain many black pixels. Black pixels are defined as background. The region file (rgn) and (cld) files for this image will have a size with larger than 10 MB. Even running a small block with seam output activated for just a few images of this type will cause OrthoVista to require 1.5 GB or more RAM to process. As this might cause a crash, OrthoVista has implemented the following functionality to assist avoiding problems.

When generating the meta data, especially the rgn files, OrthoVista checks the amount of memory needed to keep the rgn data. If the size is over a certain limit, a warning is supplied – informing about the image that exceeds the limit, and that it might cause problems when generating seams.

The limit is by default 4 MB, but this can be changed in the orthovista.cfg file with the following entry:

```
> Mosaic::WarnRegionSize 4096
```

If the rgn data size exceeds a second limitation (default is 10 MB), this will very likely cause an eventual crash because of memory overflow. OrthoVista will again provide a warning message, but it



will then switch off the seam output. Also this second limit parameter can be changed with the following entry:

```
> Mosaic::FailRegionSize      10240
```

**Please note:**

In most cases, the internal rgn data is twice as large as on disk. Images like the one shown above and even images with fewer small background regions can increase the processing time considerably.

We strongly suggest avoiding images like the one shown above. The best solution is to process the orthophotos with OrthoMaster or in case third party software is used, to scan the images, so that they do not have numerous black or white (background) pixels. If this is not possible, we suggest starting OrthoVista processing, and if OrthoVista provides warnings messages, to stop the processing after the region generation. Then you will manually manipulate the reported images.

To do this, you have to first remove the rgn files, and if present, the cld files of the reported images. Then open these images in an image editing tool like PhotoShop and change in the image area (not the border area) all background pixels (e.g. from 0 to 1). Once you have done this, restart OrthoVista by using the project file (ovp) file, which was generated automatically with the last processing run. The rgn files for the edited images will then be recomputed.

**Information: Processing images stored with PhotoShop cause slower results.**

Some programs like PhotoShop are able to store images as tiled tiff/jpeg images. Unfortunately, they often select a tile size which is as large as the image itself. This can be checked with the "tiffinfo" tool delivered on our Installation DVD.

Below please find a "tiffinfo" output example of a tiled tiff/jpeg image stored by PhotoShop. The tile size is not especially reported here, as the tile size is identical with the image size.

```
EXAMPLE: TIFF Directory at offset 0x8  
Subfile Type: (0 = 0x0)  
Image Width: 11194 Image Length: 11193  
Resolution: 72, 72 pixels/inch  
Bits/Sample: 8  
Compression Scheme: JPEG  
Photometric Interpretation: YCbCr  
YCbCr Subsampling: 1, 1  
YCbCr Positioning: cosited  
Date & Time: "2004:11:24 16:52:40"  
Samples/Pixel: 3  
Planar Configuration: single image plane
```

PhotoShop software has no problems reading this type of file format since PhotoShop always reads the entire image into memory. For photogrammetric software packages, such a format is not at all optimal since they must read many images and many small portions of images. Because of this non-optimal file format, OrthoVista is required to continually read and decompress the entire image to get a small portion of the image extracted. Since OrthoVista must often read small portions, the processing speed is drastically reduced with this image format.



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EXAMPLE: In HotSpot Removal OrthoVista V4.x performed with the above image as follows:

- PhotoShop image with tile size as large as image size: ~ **1 h 7 min**
- Image converted to a tiled tiff/jpeg image: ~ **1 min 20 sec s**
- Image converted to a scanline tiff/jpeg image with Rows/Strip = 8: ~ **1 min 50 sec**

**Note :** OrthoVista V3.x was not able to process this kind of images at all.

We strongly suggest avoiding processing images stored in the format shown above in OrthoVista. We recommend generating tiled tiff or tiled tiff/jpeg images instead, with a tile size of 128x128 pixel or 256x256 pixels, for example. If this is not possible, scanline tiff images should be used and the number of Rows/Strip kept low; optimal would be Rows/Strip = 8.

### Restriction: ADS files and Save Adjusted images

OrthoVista is not able to write adjusted images with ADS meta files of composed tiff images. Instead the whole file is treated like it would be one large file and OrthoVista checks the file size of the output image before writing it. If the file size is larger than 4 GB and it is set that an uncompressed image is written, then an error message is generated and the writing of the image is suppressed. If it is necessary to use the Save Adjusted images function for ADS files and if the file size gets larger than 4GB, it is necessary to switch on the JPEG compression.

### Restriction: Contrast Adjustment with Global Tilting

In seldom cases the contrast adjustment can have a bad impact on the global tilting result by adding too high saturation to the images. This will then cause strange colors in the output. If such a problem occurs please do the processing without having the contrast adjustment activated and you will have to remove the "tlt" files located in the meta data directory before reprocessing the images without contrast adjustment.



### Restriction: True Orthophoto Mosaicking and Feature Detection

The seam line algorithm Feature Detection is currently not supported with True Orthophoto mosaicking. Please use the Adaptive Feathering method when processing True-Orthophotos.

### Restriction: Global Tilting and rotated orthophotos

Global Tilting is not able to handle differently rotated images. If such images are detected, they are reported and the global tilting is not applied to those images.

### Restriction: Seam Editor, rotated images and images with different pixel resolution

The Seam Editor does currently not support rotated images or orthophotos with different pixel sizes.

### Restriction: Supported files size for BIP/BIL/BSQ images

The maximum file size for reading and writing of the mentioned file types is 2 GB. Whereas TIFF files can have a size of up to 4GB.



### **Restriction: Exclusion Area, Seam Region and Water Area**

If “Exclusion Area”, “Seam Region” or “Water Area” files are loaded for display purposes, they will not be stored to the project file during saving and are therefore missing when loading the project again.

Should you have any questions regarding the technical details of software, please contact your Support Team at [support@inpho.de](mailto:support@inpho.de).