

Sunex Dewarper Mini User Guide v1.2

www.sunex.com

TABLE OF CONTENTS

<u>1</u>	<u>OVERVIEW</u>	<u>2</u>
<u>2</u>	<u>INSTALLATION</u>	<u>2</u>
<u>3</u>	<u>PROCEDURE</u>	<u>3</u>
<u>4</u>	<u>USER INTERFACE</u>	<u>4</u>
<u>5</u>	<u>EXAMPLES</u>	<u>5</u>
5.1	DISTORTION CANCELLATION	5
5.2	DISTORTION TAILORING	7
5.3	ONE-SHOT PANORAMA	8
5.4	SPHERICAL/CYLINDRICAL PANORAMA	9
5.5	CREATING A QUICKTIME-VR (MOV) FILE FROM DEWARPER SPHERICAL OUTPUT	10
5.6	360° PANORAMA	11

1 Overview

Optical distortion is un-avoidable for ultra wide-angle and fisheye lenses. Sunex Dewarper Mini is a Adobe Photoshop compatible plug-in for processing distortion taken with Sunex miniature ultra wide-angle and fisheye lenses. It remaps the pixels such that the processed image is optimized for the intended application. This software is based on a new proprietary model developed by Sunex for real-world lenses. Unlike other distortion correction software, Dewarper Mini does not require that the lens follows the idealistic $f-\theta$ mapping. All distortion types can be modeled including our Tailored Distortion™ lenses.

Key Features

- Distortion cancellation: This feature compensates for the optically distortion in the lens. The resulting image is what one would see if the lens has zero optical distortion. If the horizontal field of view is greater than about 100 degrees, the off-axis objects may look stretched. This is caused purely by the fact that the lens is very close to objects, not the lens distortion itself.
- Distortion tailoring: This feature allows one to optimize the amount of the distortion in the image. It can be used to simulate images taken with lenses having different amount of distortion (for example, our Tailored Distortion lenses).
- One-shot panorama: This is a new projection method developed by Sunex for creating a 180° panorama from a single fisheye shot. This eliminates the process of stitching together multiple images.
- Spherical and cylindrical panorama: This takes a circular fisheye image and expands it into spherical or cylindrical panoramic projections suitable for viewing with popular VR viewers such as Apple QuickTime.
- 360 degree panorama: This is used to “unwrap” the 360 degree surrounding captured by a fisheye lens when it is pointing vertically.

2 Installation

Sunex Dewarper Mini is compatible with all image editors that accept Adobe Photoshop-compatible plug-ins such as follows:

- Adobe Photoshop 7.0 and higher versions
- Photoshop Elements 2 and higher versions
- PaintShop Pro 7 and higher versions

The installation of the Dewarper Mini is simple.

- Locate the plug-in folder for your program. Table 1 shows the typical directories used by popular programs

Table 1 Typical plug-in directory

Program	Plug-in folder
Adobe Photoshop	C:\Program Files\Adobe\Photoshop\Plug-Ins\
Adobe Photoshop Elements	C:\Program Files\Adobe\Photoshop Elements\Plug-Ins\
Corel Paintshop Pro	C:\Program Files\Paint Shop Pro\Plugins\

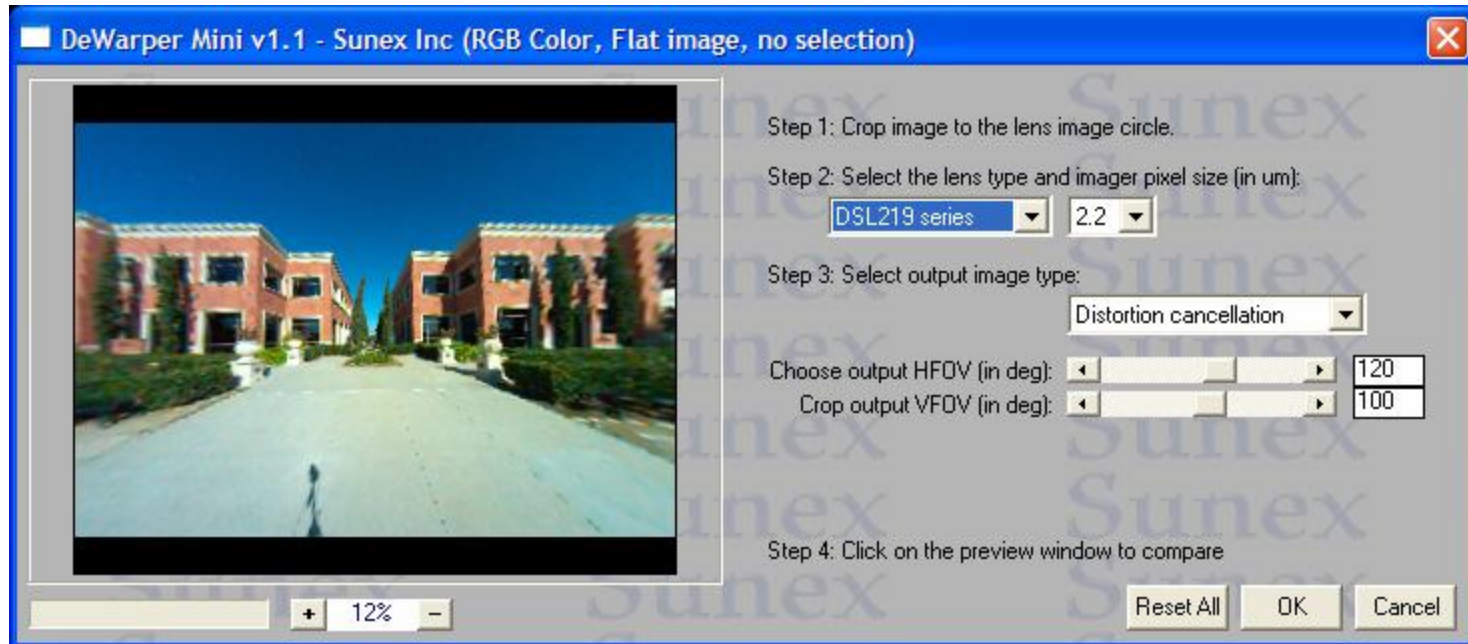
- Copy the “.8bf” file to plug-in folder of your program.
- Open your image editor
- Open a JPEG file or any 8-bit RGB files.
- Dewarper Mini should now be accessible from the plug-in menu of your image editor under “Sunex”.

3 Procedure

The procedure for processing images is as follows:

- Use your image editor to crop the image so that the horizontal width of the image matches the lens image circle.
- Start the Dewarper Mini filter
- Choose the Sunex lens used from the drop down box.
- Choose the pixel pitch of the imager in μm in the drop down box.
- Select an output image type from the drop down box.
 - Specify output parameters – the available options depend on the output image type selected. See next section for details.
 - If the “Transform X only” box is checked, the processing is only applied to the horizontal direction.
- Click on the preview window to compare the image before and after processing.
- Click on OK to process the full size image.

4 User Interface

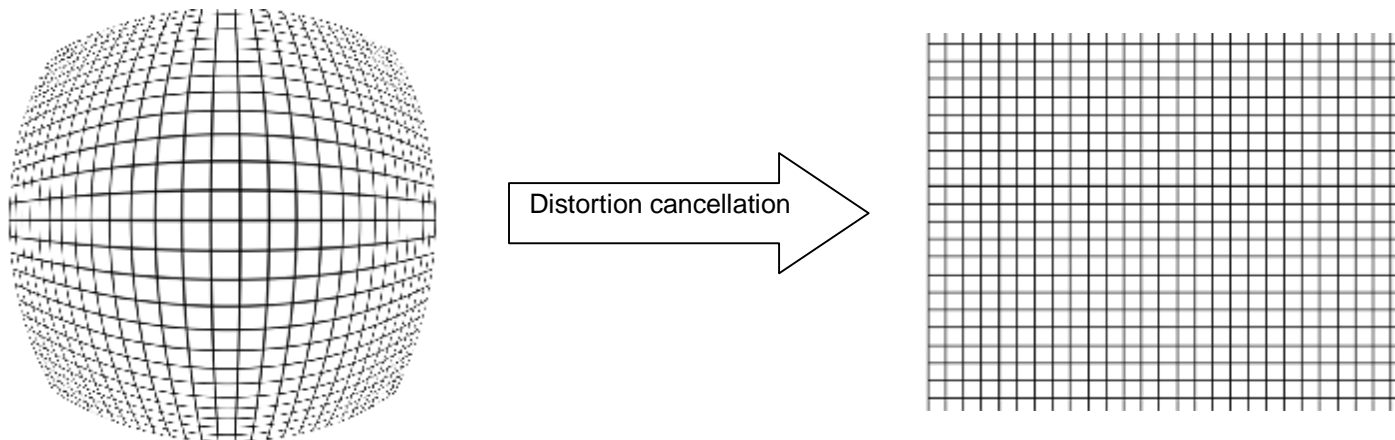


The user interface is straightforward and self-explanatory. The small preview window on the left shows the image in real-time as the output parameters are adjusted. Click anywhere within the preview window brings back the original image for quick comparison.

5 Examples

5.1 Distortion Cancellation

This compensates for the optical distortion in the lens. If the horizontal field of view is greater than about 100 degrees, the off-axis objects may look stretched. This is caused purely by the fact that the lens is very close to objects, not the lens distortion itself. Therefore, it is recommended that the horizontal field of view of the output image be kept <100 degrees.





Distortion cancellation
HFOV: 100°



5.2 Distortion Tailoring

Choose this output to increase/decrease the amount of distortion in the image. First, select an output image horizontal field of view (HFOV). Then, use the “adjust distortion” slider to vary the amount of distortion. It is used for optimize the amount of distortion in a wide-angle shot, and to simulate the effect of a lens with different distortion. It achieves the effect of “field of view preserving zooming”.



More distortion



Less distortion



5.3 One-Shot Panorama

This is a new projection method for creating a one-shot panoramic image with 180° horizontal field of view (vertical FOV is cropped to 70°). No stitching of multiple images is required.



5.4 Spherical/Cylindrical Panorama

These features are used to create traditional spherical and cylindrical projections.



Spherical projection



Cylindrical projection



5.5 Creating a QuickTime-VR (mov) file from Dewarper Spherical Output

Please contact us for methods of converting spherical output to QuickTime VR format suitable for embedding on web pages.

360° Panorama

If the input image is taken with the camera pointing vertically (up or down), the 360° surrounding is captured. Choose this output type to obtain a 2D panorama having 360° horizontal field of view. The following input image is taken with the camera sitting on a conference table pointing up.



Peripheral image is unwrapped to a 2D panorama with 360° HFOV.

