

AstroWave

Image registration program

Latest Version: v1.0 RC 1 (28th September 2004)

AstroWave is a program that calculates the linear transformation details needed to register one image with another, ie. rotation and scaling. This is very useful when combining a number of images together for LRGB composites, stacks, or mosaic where one or more frames need rotating or scaling. The actual rotation and scaling is not done within this package - other programs (such as Photoshop) have been doing this for years, and very well too, so it is left for them to perform!

Disclaimer:

This program is offered 'as-is' with no guarantees made as to fitness or suitability for any purpose, and no liability assumed for any loss or damage resulting from its use. Downloading and use of the program is done at your own risk. Selling or re-distribute of **AstroWave** is not allowed without written permission from Simon C. Smith, but you may download it from this site or publish links to this page (<http://www.planetsi.plus.com/AstroWave/AstroWave.html>)

PostCardWare:

If you like this program, or find it useful, please email me for my address and then send me a postcard as a form of gratitude! The idea of PostCardWare is to humanize the transaction, remind the user that someone else shared something freely, and remind the provider that someone is actually using the creation. If you have comments, feedback or suggestions concerning **AstroWave** drop me an email at apollo@planetsi.plus.com

At-A-Glance Guide:

- First, you need to load in 2 images (Currently this supports bmp, gif, jpeg, jpg, png, & tif). You can do this in a number of ways.
 - Use the File->Load menu to load in 2 images
 - Drag and drop 2 files together onto the dialog
 - Drag and drop individual files onto the image pads on the dialog.
- The first image loaded is the image which you want to register.
- The second image to load is the reference image.
 - The image displayed on the left is the registration image, the right the reference image.
- The program will then automatically resizes the dialog to fit the images onto the screen.
- If the images are too large to be seen together, use the View menu to scale the displayed images.
 - Note, shrinking the images only effects the displayed result. All calculations are done using the original image size (this includes zooming to 200%).
- Click on 2 common registration points on each image - the wider the separation the better.
- Each click will either add a new point, or move an existing point as follows:
 - The first 2 clicks place the 2 anchor points.
 - Subsequent clicks move the currently selected "editing" radio button anchor
 - Unless you click **INSIDE** the outer rectangle of an anchor point you can refine an anchors position.
- Centroid helper
 - If you select Snap To Centroid (either the tick box on the dialog or the from the edit

menu), the program will attempt to place the anchor on the centre of the nearest star to where you click. (It searches a 20x20 grid surrounding the cursor).

- For best use make sure you use an isolated star.
 - Use the threshold button and edit box to make the centroid calculation ignore background noise (see below) - without setting a background threshold you will not reap the rewards of using the centroid system.
- **Threshold settings**
 - AstroWave can be told to ignore background noise on an image to aid in the calculation of the centroid of a star.
 - Either enter the background value in the edit box (range 0-255) or
 - Click the Threshold button and then on an area of background sky on one of your images.
 - AstroWave samples a 20x20 pixel area around the cursor to calculate the threshold (it adds 10% to the average to give best results).
 - If the centroid snapping does not seem to work too well, manually increase the threshold using the edit box.
 - If a selection was set using centroid snapping, the resulting box will be drawn in **light blue**. If it was manually positioned, it will be drawn in **green**.
 - The rotation (displayed in degrees clockwise) and scale (displayed as a percentage) needed to transform image 1 onto image 2 is displayed at the top once 2 control points are set on each image.
 - Use Photoshop (or otherwise) to first rotate, then scale the image as indicated.
 - Your 2 images are now registered!

Reference:

File Menu:

- **Load images** - (first is the image to register, second the reference image)
- **Exit** - Quit AstroWave

Edit Menu:

- **Anchor 1/2** - Anchor to move when clicking outside of anchor boxes on an image (Except for the first 2 clicks which place anchor points 1 and 2 initially - as long as the second click is outside the anchor box of anchor 1)
- **Snap To Centroid** - Turn on centroid snapping when placing and moving anchor points on the image.

View:

- **200%-25%** - Set the zoom level to display the images. This does not effect any calculations - these are all done with the original image data at 100% size.

Help:

- **Help** – Bring up this PDF help document
- **About** – Display contact and copyright information about AstroWave.

Drag and Drop

- Files can be dragged over the image pads to replace or initially load an image.
- If 2 or more files are dragged, the first 2 selected (from windows point of view) are used to load into the 2 image pads.
- If a file is not dragged onto an image pad, it is loaded into the first image pad.
- Invalid files are not allowed, and a warning will be presented to the user.

Notes on use with iMerge:

- iMerge only likes rectangular images.
- After transformation, you must crop your rotated image into rectangular pieces.
- These rectangular pieces can then be added and composited together in iMerge.

Notes on use with K3CCD:

- To import with other frames into K3CCD you need to make sure all images are of the same size.
- Either crop your rotated image to the correct size on Photoshop
- Or expand the canvas of the other frames to the same size as the largest rotated/scaled image.

Example:

The results of using **AstroWave** can be seen at www.planetsi.plus.com/Cassiopeia.jpg and the processing details here www.planetsi.plus.com/Details.txt.

(c)2004 Simon C. Smith - Planet-Si.

e-mail: apollo@planetsi.plus.com

website: <http://www.planetsi.plus.com/AstroWave/AstroWave.html>