Subject: Re: rotation matching of 2D images Posted by Wayne Landsman on Mon, 31 Jul 2006 12:09:17 GMT View Forum Message <> Reply to Message

"phil" <philippe_kobel@yahoo.es> wrote in message news:1154160396.159851.81990@i42g2000cwa.googlegroups.com...

> Hello!

>

- > I have 2 images of same sizes, but different orientations.
- > One of these images is my 'reference' image, and the other one is the
- > 'target' image, that I would like to rotate, so that the orientation of
- > its features match the orientation of the reference image.

>

- > I would then need an algorithm performing some kind of
- > cross-correlation and returning the adequate rotation angle(I could
- > then use the idl function ROT afterwards).

>

If you can locate matched features on each image, so that the (X1i, Y1i) points on one image are matched with (X2i, Y2i) on the rotated image, then I would use POLYWARP to determine the coefficients to pass to POLY 2D to perform the rotation. See the example in the POLYWARP documentation, and note that the IDL ROT() function also calls POLY_2d.

This is fine for aligning images, though it applies a general linear transformation rather than just a rotation. If you are certain that you just want to apply a rotation, then I would define a function of one variable (say, theta) that computes the summed distances between the (X2i, Y2i) and the rotated input features (X1i*cos(theta) - Y1i*sin(theta), X1i*sin(theta) + Y1i*cos(theta)). (Be sure all X,Y are measured from the center of rotation.) Then minimize this function -- I like to use Craig Marwardt's tnmin.pro for this (http://astrog.physics.wisc.edu/~craigm/idl/down/tnmin.pro) -- to find the best angle.

Finally, if you don't have the matched features, then in principle one can do more of a "blind" determination of the rotation, by finding the rotation that maximizes the correlation coefficient between the two images. a program that does this to determine shifts (http://idlastro.gsfc.nasa.gov/ftp/pro/image/correl optimize. pro) but it would be considerably more CPU-intensive, and somewhat more complicated to do this

for rotations. --Wayne

Subject: Re: rotation matching of 2D images Posted by Craig Markwardt on Mon, 31 Jul 2006 15:47:27 GMT

'phil" <philippe< th=""><th>_kobel@yahoo.es></th><th>writes:</th></philippe<>	_kobel@yahoo.es>	writes:
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> Does somebody have a clue of such a procedure?

Wayne has some good suggestions. I was also impressed by this paper:

http://www.nmt.edu/~hjxie/Auto.pdf

which has sample IDL code to do image reconstruction by FFT, including rotation, scale and shift.

Craig

Craig B. Markwardt, Ph.D. EMAIL: craigmnet@REMOVEcow.physics.wisc.edu Astrophysics, IDL, Finance, Derivatives | Remove "net" for better response