Subject: Navigating AVIRIS Images
Posted by Scott Ozog on Tue, 20 Aug 2013 18:25:52 GMT
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Hi I'm still new to IDL, and I'm trying to learn it for grad school. I'm trying to navigate images from NASA's AVIRIS platform. If anyone has experience in this it would be greatly appreciated.
I have a file that has Lons in band 1, Lats in band 2, and a elevation model image in band 3.
The arrays are [677, 3068] and the resolution of each pixel is unknown. The image is in UTM using WGS84.

The actual image file is larger in both sample and lines, but I'm at least trying to learn how the MAP_PATCH or Fanning's WarpToImage procedures work. I still can't quite get them to work yet with my image.

Thanks,
Scott

Subject: Re: Navigating AVIRIS Images
Posted by David Fanning on Tue, 20 Aug 2013 19:29:24 GMT
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Scott Ozog writes:

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I wouldn't waste too much time with cgWarpToMap. I am THIS close to the IDL Holy Grail and I've got cgWarpToMap all torn apart right now. I've been searching for 10 years to find a fast way to convert a MODIS swath file to a navigable image and I am very, very close. (In fact, I woke up at 2AM and worked on it last night, when I had a new idea.)

If this image is already projected, though, as you indicate, I doubt very much that you will need to bother with either Map_Patch or cgWarpToMap. Rather, you will need the UTM zone number, which you can obtain from cgUTMZone by passing in any lat/lon pair you have laying around in your lats and lons arrays.

```
zone = cgUTMZone(lon[0,0], lat[0,0])
```

Then, you need a map object:

```
map = Obj_New('cgMap', 'UTM', ELLIPSOID='WGS84', Zone=zone)
```

Make sure the longitudes are in the range -180 to 180.

```
lons = ((lons + 180) MOD 360) - 180
```

Convert these values to XY projected meter space:

```
xy = map -> Forward(lons, lats)
```

Find the min and max of the X and Y space:

```
x = Reform(xy[0,*])
y = Reform(xy[1,*])
xmin = Min(x, MAX=xmax)
ymin = Min(y, MAX=ymax)
```

Find the size of your image:

```
s = Size(image, /Dimensions)
```

Calculate the X and Y scales:

```
scale_x = (xmax - xmin) / (s[0]-1)
scale_y = (ymax - ymin) / (s[1]-1)
```

Calculate the XY ranges and set the map object appropriately:

```
rect = [xmin-(scale_x/2.), ymin-(scale_y/2.), $
      xmax+(scale_x/2.), ymax+(scale_y/2.)]
xrange = rect[[0,2]]
yrange = rect[[1,3]]
map -> SetProperty, XRANGE=xrange, YRANGE=yrange
```

Display your image and navigate it.

```
cgDisplay, Aspect=image, 800, 800
cgImage, image
cgMap_Continents, Map=map, Color='red6'
cgMap_Grid, Map=map, Color='blu6'
```

Cheers,

David
--
David Fanning, Ph.D.

Fanning Software Consulting, Inc.
Coyote's Guide to IDL Programming: http://www.idlcoyote.com/
Sepore ma de ni thue. ("Perhaps thou speakest truth.")

Subject: Re: Navigating AVIRIS Images
Posted by Phillip Bitzer on Tue, 20 Aug 2013 19:42:20 GMT
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>
> I am THIS close to the IDL Holy Grail and I've got cgWarpToMap all torn apart right now.

Just remember to "Choose wisely" and if you do, don't take the Grail beyond the Great Seal. :-)

Tangentially related, I threw some radar data at your working example and it worked great! (Well except some radar-related problems, particularly non-uniform gate size. But that can be overcome....)

Subject: Re: Navigating AVIRIS Images
Posted by David Fanning on Tue, 20 Aug 2013 19:47:14 GMT
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David Fanning writes:

> Display your image and navigate it.
>
> cgDisplay, Aspect=image, 800, 800
> cgImage, image
> cgMap_Continents, Map=map, Color='red6'
> cgMap_Grid, Map=map, Color='blu6'

Forgot to set the position on the map object. Do this before you call cgMap_Continents, etc.

```
map -> SetProperty, Position=[0,0,1,1]
```

Cheers,

David

--
David Fanning, Ph.D.
Fanning Software Consulting, Inc.
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Sepore ma de ni thue. ("Perhaps thou speakest truth.")

Subject: Re: Navigating AVIRIS Images
Posted by Scott Ozog on Thu, 22 Aug 2013 16:24:03 GMT
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On Tuesday, August 20, 2013 3:29:24 PM UTC-4, David Fanning wrote:
> Scott Ozog writes:
>
>
>
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>
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> obtain from cgUTMZone by passing in any lat/lon pair you have laying
>
> around in your lats and lons arrays.
>
>
>

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>
>
>
> Then, you need a map object:
>
>
>
>   map = Obj_New('cgMap', 'UTM', ELLIPSOID='WGS84', Zone=zone)
>
>
>
> Make sure the longitudes are in the range -180 to 180.
>
>
>
>   lons = ((lons + 180) MOD 360) - 180
>
>
>
> Convert these values to XY projected meter space:
>
>
>
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>
>
>
> Find the min and max of the X and Y space:
>
>
>
>   x = Reform(xy[0,*])
>
>   y = Reform(xy[1,*])
>
>   xmin = Min(x, MAX=xmax)
>
>   ymin = Min(y, MAX=ymax)
>
>
>
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>
>
>
>   s = Size(image, /Dimensions)
>

>
>
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>
>
>
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>
>   scale_y = (ymax - ymin) / (s[1]-1)
>
>
>
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>
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>   cgMap_Grid, Map=map, Color='blu6'
>
>
>
> Cheers,
>
>
>
> David
>

> --
>
> David Fanning, Ph.D.
>
> Fanning Software Consulting, Inc.
>
> Coyote's Guide to IDL Programming: http://www.idlcoyote.com/
>
> Sepore ma de ni thue. ("Perhaps thou speakest truth.")

Thank you Dr. Fanning!
That helped a lot. Combining this with the last part of your warptomap.php I was able to get something like what I'm trying to do. However, I know that my image is not oriented N-S and that is how it is being displayed on the map... Just confined to its x and y min/max. I'm not sure how to upload a photo to show you what I mean. The image is a small swath only about 10km x 50km in southern New Mexico.

Thanks,
Scott Ozog
University of Maryland
Department of
Earth and Atmospheric Science

Subject: Re: Navigating AVIRIS Images
Posted by David Fanning on Thu, 22 Aug 2013 16:52:39 GMT
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Scott Ozog writes:

> That helped a lot. Combining this with the last part of your warptomap.php I was able to get something like what I'm trying to do. However, I know that my image is not oriented N-S and that is how it is being displayed on the map... Just confined to its x and y min/max. I'm not sure how to upload a photo to show you what I mean. The image is a small swath only about 10km x 50km in southern New Mexico.

UTM grids are always oriented N/S! That's sort of the definition of a
UTM grid. :-)

Save it as a PNG file and e-mail it to me. I see these images are
rotated by about 19 degrees. Did you use the ROTATE keyword and set it
to this amount when you set up the map projection?

Cheers,

David

--
David Fanning, Ph.D.
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