

Remote Sensing of the Environment
GEOG/GEOL 4093
Fall Semester 2011

Exploring Some ENVI Features

12/02/2011, Due: 12/02/2011

The objective of this lab is to practice some other ENVI features.

Part I

Navigate to *Z:\Geog Files\Hart\rs4093* and copy the folder “*Lab_12_1*” to “*D:*” drive

1) Open the files in *D:/Lab_12_1*

- a. Open the aerial photos (*40105A3NE.tif; 40105A3NW.tif; 40105A3SE.tif; 40105A3SW.tif*) in ENVI.
- b. Open the Digital Elevation Model (DEM) file “*Boulder.dem*” using *File>Open External File>USGS>DEM> USGS DEM Input Parameters* window appears, select *Output Result to Memory*, and hit OK.

2) Mosaicking

The photos represents 4 parts (NE, NW, SE, SW) of Boulder, to combine them in one image we can use the mosaicking feature in ENVI. The Georeferenced Mosaicking is used to automatically overlay multiple georeferenced images.

Select *Map* (main ENVI menu)>*Mosaicking>Georeferenced*, *Map Based Mosaic* window appears, Select *Import> Import Files*, import the 4 photos one after another or all at once. To mosaic select *File>Apply* and add the image to Memory and load it into a separate window.

3) Associate *Boulder* image to *Boulder.dem*

Select *File* (main ENVI menu)>*Edit ENVI Header>Input File* (*Boulder* mosaic image in memory), hit ok, *Header Info* window appears, from *Edit Attributes* select *Associate DEM File>DEM Image*. Display *Boulder* mosaic image.

4) Add color scheme to your image

Select *Tools>Color Mapping>ENVI Color Tables*, select a color scheme that is suitable to identify the features in your image.

5) Display the colored image in 3 dimensions

Display the image in 3 dimensions by selecting *Tools>3D SurfaceView*, *3D SurfaceView Input parameters* window appears, check 512 and uncheck 64 and hit ok. In *3D SurfaceView* window select *Options>Surface Controls*, make fun with different features (e.g. change vertical exaggeration, let it moves, etc...).

Part II

Navigate to *Z:\Geog Files\Hart\rs4093* and copy the folder “*Lab_12_2*” to “*D:*” drive

First open the aerial photos *Boulder* and *Boulder_Geo* in *D:/Lab_12_2* in ENVI and display the two images.

Registration

Registration is used to reference images to geographic coordinates and/or correct them to match base image geometry. In this exercise we will georeference the Boulder mosaic aerial photo using the same georeferenced image (this is to make the exercise much easier, however you can use any other georeferenced image from the same sensor or any other one, or we can use a map). You have to select ground control points (GCPs) from Image windows. Please, follow the following instructions in order to Georeference Boulder image from *Boulder_Geo* image:

- a) Select *Map* (main ENVI menu)>*Registration*>*Select GCPs: Image to Image* (Image to Image Registration Window appears).
- b) Select *Boulder_Geo* Display for Base Image and *Boulder* Display for Warp Image and hit OK, the Ground Control Points Window Selection appears.
- c) Hit Show list, empty Image to Image GCP List appears (because we do not select any point yet).
- d) Select 4 GCPs, one after another (you have to select at least 4 GCPs in order to register an image), and hit Add Point, it appears on Image to Image GCP List Window, please Observe the Error and RMS.
- e) After you completed the selection of the 4 points, Select *Options* (Ground Control Points Selection)>*Warp File* Input Warp Image Window Appears, Select *Boulder* and hit OK, put the output image to Memory.
- f) Display the resulted image and discuss what happened?
- g) Add more 4 points and Warp the image again and put it to Memory.
- h) Discuss any differences (if any) between georeferencing using 4 points and 8 points, and also compare both of them to the original image?

Overlay Grid Lines (Latitudes and Longitudes)

Select *Overlay* (Image Window)> *Grid Lines*, Grid Line Parameters Window appears, turn off Pixel Grid (if not already) and Map Grid, and place 1 instead of 5 in *Spacing* of the *Geographic Grid*, and hit apply. Select *Options* (Grid Line Parameters)> Edit Geographic Grid Attributes, Turn *Lines* and *Box* on and play with it (Change the color of lines, Font of text, etc...)