

## pyGeoNet

This is the python implementation of GeoNet originally written in MATLAB and maintained at <https://sites.google.com/site/geonethome/>

This version of GeoNet follows the same algorithm as GeoNet with a few differences enumerated below.

1. The geotiff files i.e. lidar datasets are read using gdal libraries
2. The internal and external hull created within GeoNet are not created in pyGeoNet. This step has no effect on the final results obtained.
3. The slope and curvature are computed using gradient function in numpy library and this might have some differences.
4. The biggest difference between GeoNet[MATLAB] and pyGeoNet is the flow accumulation. GRASS GIS is used in the background to read the filtered DEM and then compute flow accumulation using the r.watershed functionality in GRASS GIS. This might produce different flow accumulation values than GeoNet[MATLAB].
5. The fast marching algorithm used for computing geodesics is also different. pyGeoNet uses scikit-skfmm library to compute the cost function.
6. The skeleton threshold used to remove rouge skeleton pixels is also not the same as in GeoNet. This is more of a bug in pyGeoNet rather than a difference.

On a new machine:

install python

install pip

download get-pip.py from <https://pip.pypa.io/en/latest/installing.html>

Download GRASS GIS:

This version of the pygeonet is tested on WinGRASS-7.0.0svn-r61281-1030-Setup (64 bit)  
Upon installation of the GRASS GIS we need to set up some environment variables to call GRASS GIS modules outside GRASS environment.

Not sure if we will need all of them, but you can try all the combinations below.

GISBASE C:\GRASSGIS7SVN GISRC C:\Users\Harish\Documents\.grass7

GRASS\_SH C:\GRASSGIS7SVN\mysys\bin\sh.exe

LD\_LIBRARY\_PATH C:\GRASSGIS7SVN\lib

PYTHON\_INCLUDE C:\Python27\include PYTHON\_LIB C:\Python27\libs\Python27.lib

PYTHONLIB C:\GRASSGIS7SVN\Python27 PYTHONPATH C:\GRASSGIS7SVN\etc\python

The .grass7 file should be as below:

GISDBASE: C:\Users\Harish\Documents\grassdata

LOCATION\_NAME: geonet

MAPSET: geonetuser

GRASS\_DB\_ENCODING: ascii

## Dependencies

Like many open-source programs, pyGeoNet depends on the work of many others in the form of libraries and uses those libraries to achieve the goal. Please install the below libraries before running the pygeonet\_processing.py file

## Essential packages

Some of the required libraries for this software to work: 'argparse==1.2.1', 'backports.ssl-match-hostname==3.4.0.2', 'bottleneck==0.8.0', 'gdal==1.11.0', 'image==1.3.3', 'jinja2==2.7.3', 'markupsafe==0.23', 'matplotlib==1.3.1', 'numpy==1.8.2', 'pandas==0.14.1', 'patsy==0.3.0', 'pillow==2.6.1', 'pyparsing==2.0.2', 'pyreadline==2.0', 'python-dateutil==2.2', 'pytz==2014.4', 'pyzmq==14.3.1', 'qrcode==5.1', 'reportlab==3.1.8', 'scikit-fmm==0.0.5', 'scipy==0.14.0', 'six==1.7.3', 'statsmodels==0.5.0', 'stevedore==0.15', 'tornado==4.0.2'