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FEASIBILITY STUDY FOR GEO-LOCATION ASSESSMENT OF OPTICAL SENSORS GEOACCA

Software Installation Manual

Deliverable D09

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ABSTRACT:

This report describes the setup and installation of the python based GeoAcca package.

The full documentation in html format including the software installation and usage is part of the GeoAcca software package.

The work described in this report was done under ESA Contract. Responsibility for the contents resides in the authors or organisation that prepared it.

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DOCUMENT CHANGE LOG

Issue/ Revision	Date	Modification	Modified pages	Observations
1.0	27/10/2015	All	All	-
1.1	21/12/2015	All	All	Update to Software version 1.1.0

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GeoAcca Documentation

Release 1.1.0

ENVEO IT GmbH

December 21, 2015

ONE

INSTALLATION

1.1 Prerequisites

GeoAcca requires certain software to be set up on the environment in which it will be installed. Please refer to the sections below to verify that your environment meets the particular system requirement before proceeding with the installation.

1.1.1 Database

GeoAcca supports a PostgreSQL/PostGIS database back-end, having:

- PostgreSQL >= 8.4
- PostGIS >= 1.5.8

1.1.2 Software

The following BEAM software is required before installing GeoAcca:

- Beam GPT >= 4.11

In addition, GeoAcca needs access to the GETASSE30 digital elevation model:

- GETASSE30 DEM

1.1.3 Operating System

The software package has been developed and tested under:

- Linux Fedora release 21
- CentOS Linux release 7

1.2 Requirements

GeoAcca has the following requirements for building and usage:

- Python
- NumPy
- GDAL (including GEOS) The GDAL module is required for raster support.

- SciPy The SciPy module is currently used for reassigning raster bitmaps.

- matplotlib The matplotlib module is used for plotting raster and vector data.

- basemap The basemap module is used for plotting raster and vector data on cartographic maps.

- OpenCv The OpenCV module is currently used for template matching.

- PyGreSQL The PyGreSQL module interfaces to the PostgreSQL database.

- dateutil The dateutil module is an extension to the standard datetime module.

- pytz Library for timezone calculations.

- setuptools The setuptools package is used for building GeoAcca.

- graphviz Graphviz is used for graphical visualizations in the documentation.

- h5py The h5py package is used to access HDF5 data sets.

Note: The following package versions have been used for development: Python 2.7.5 , NumPy 1.7.1, GDAL 1.9.2, SciPy 0.12.1, matplotlib 1.2.0, basemap 1.0.6, OpenCv 2.4.5, PygreSQL 4.1.1, dateutil 1.5-0, pytz 2012d-7, setuptools 2.0-8, graphviz 2.38.0, h5py 2.5.0

List of required packages:

	Fedora 21	CentOS 7
Numpy	numpy	numpy
GDAL	gdal-python	gdal-python
SciPy	scipy	scipy
matplotlib	python-matplotlib	python-matplotlib
basemap	python-basemap	python-basemap
OpenCV	opencv-python	opencv-python
PyGreSQL	PyGreSQL	PyGreSQL
dateutil	python-dateutil	python-dateutil
pytz	pytz	pytz
setuptools	python-setuptools	python-setuptools
graphviz	graphviz	graphviz
h5py	h5py	h5py

1.3 Building from source

1.3.1 Database setup

Ensure you have access to a PostgreSQL server. As PostgreSQL superuser create a user and a database named geoacca:

```
$ createuser geoacca -E -P
$ createdb --encoding=UTF8 --owner=geoacca geoacca
```

Enable the PL/pgSQL (Procedural Language/PostgreSQL Structured Query Language) and the PostGIS extension for your PostgreSQL database.

For **PostgreSQL 9.1 and higher** run:

```
$ psql -d geoacca -c "CREATE LANGUAGE plpgsql;"
$ psql -d geoacca -c "CREATE EXTENSION postgis;"
```

For **PostgreSQL lower 9.1** run:

```
$ psql -d geoacca -c "CREATE LANGUAGE plpgsql;"
$ psql -d geoacca -c psql -d geoacca -U geoacca -f postgis-64.sql
$ psql -d geoacca -U geoacca -f spatial_ref_sys.sql
```

Note: The PostGIS SQL files are installed in the share/contrib/postgis-2.1 folder of your PostgreSQL install.

To create the database tables change to the root of the GeoAcca source tree:

```
$ psql -d geoacca -h <HOST> -U geoacca --variable=myschema=<SCHEMA> -f src/db/geoacca_schema.sql
```

Note: It is recommended to set the variable `myschema` to a value other than `public`, e.g. `geoacca_vXrX`, in order to avoid mixing up GeoAcca with PostGIS installation.

In your `home` directory create a file named `.pgpass` by running the following command:

```
$ touch .pgpass; chmod 600 .pgpass
```

Then add the following line to your `.pgpass` file:

```
<HOST>:<PORT>:geoacca:geoacca:<PASSWORD>
```

1.3.2 Building and Installing

GeoAcca uses the Python distutils framework for building and installing.

If one of the required modules (gdal, numpy, scipy, matplotlib, basemap, PyGreSQL, dateutil or pytz) is not already installed in your Python environment, the GeoAcca setup process will try to download and install it before continuing to install GeoAcca.

Note: The setuptools option `zip_safe` is forced to *False* in the package setup script. For performance enhancement, you may reset the `zip_safe` flag, forcing the package to be installed as zip file. But notice in this case you have to adjust the package configuration files `*.cfg` in the root of the GeoAcca source tree under `src/config` before installation. For more details see *Configuration-reference-label*.

To build GeoAcca (from the root of the GeoAcca source tree):

```
$ python setup.py build
```

To install GeoAcca (from the root of the GeoAcca source tree):

```
$ python setup.py install
```

1.3.3 Troubleshooting

No Permissions

If you get an error mentioning that you do not have the correct permissions to install GeoAcca into the default `site-packages` directory, you can try installing with:

```
$ python setup.py install --prefix=$HOME/python
```

which will install into the python directory in your home directory.

Note: If the installation directory is not on your default search path for module files, add an entry to `PYTHONPATH` e.g.:

```
$ export PYTHONPATH=$HOME/python/lib/python2.7/site-packages:$PYTHONPATH
```

Alternatively, you can also try installing with:

```
$ python setup.py install --user
```

which will install into a default directory in your home directory.

The required version of setuptools is not available

If upon running the `setup.py` script you get a message like

> The required version of setuptools (>=0.9.8) is not available, and can't be installed while this script is running. Please install a more recent version first, using 'easy_install -U setuptools'.

this is because you have a very outdated version of the setuptools package which is used to install Python packages. Normally GeoAcca will bootstrap a newer version of setuptools via the network, but setuptools suggests that you first *uninstall* the old version.

However, in the likely case that your version of setuptools was installed by an OS system package (on Linux check your package manager like apt or yum for a package called `python-setuptools`), trying to uninstall with `easy_install` and without using `sudo` may not work, or may leave your system package in an inconsistent state.

1.3.4 Building documentation

Building the documentation requires the GeoAcca source code and the package:

- Sphinx >= 1.0 or later (and its dependencies)

There are two ways to build the GeoAcca documentation. The most straightforward way is to execute the command (from the GeoAcca source directory):

```
$ python setup.py build_sphinx
```

The documentation will be built in the `docs/_build/html` directory, and can be read by pointing a web browser to `docs/_build/html/index.html`.

The LaTeX documentation can be generated by using the command:

```
$ python setup.py build_sphinx -b latex
```

The LaTeX file `GeoAcca.tex` will be created in the `docs/_build/latex` directory, and can be compiled using `pdflatex`.

The above method builds the API documentation from the source code. Alternatively, you can do:

```
$ cd docs
$ make html
```

And the documentation will be generated in the same location, but using the *installed* version of GeoAcca.