

Note: The following has been tested successfully on NU Discovery cluster

## 1. Connect to the Discovery cluster

Two options here (I prefer the 2nd):

## 2 (1st option) Obtain and install Miniconda executable specifically for python 2.7

### 2.1 Obtain

```
$ wget https://repo.anaconda.com/miniconda/Miniconda2-py27_4.8.3-Linux-x86_64.sh
```

### 2.2 Install

```
$ bash Miniconda2-py27_4.8.3-Linux-x86_64.sh
```

or

## 2 (2nd option). Load Anaconda module and activate it

```
$ module load anaconda2/2018.12  
$ echo ". /shared/centos7/anaconda2/2018.12/etc/profile.d/conda.sh" >> ~/.bashrc  
$ source ~/.bashrc
```

## 3. Reserve a gpu/multigpu compute node

```
$ srun -p gpu --nodes=1 --pty --gres=gpu:1 --time=04:00:00 --export=ALL /bin/bash
```

## 4. Activate the environment

If you went with the [first option](#):

```
$ source miniconda2/bin/activate
```

If you went with the [second option](#):

```
$ module load anaconda2/2018.12  
$ conda activate
```

If everything goes well, (base) will show up next to your `username@computenode` in shell, as

```
(base)[username@c0001]$
```

## 5. Load the required modules

```
$ module load boost/1.63.0  
$ module load cuda/10.2
```

## 6. Create a conda environemnt for PyGBe (takes a while)

First, delete the previously created `pygbe-env` environment from the old installation. You might have named it differently. If that's the case, you can see your environments at

```
$ ls ~/.conda/envs
```

### To remove the old environment

```
$ conda remove -n pygbe-env --all
```

or delete the env folder

```
$ rm -rf ~/.conda/envs/pygbe-env
```

### To create the new environment

```
$ conda create -n pygbe-env python=2.7
```

## 7. Activate the PyGBe environment

```
$ conda activate pygbe-env
```

## 8. Install the remaining dependencies

### 8.1 numpy and scipy

```
$ conda install numpy scipy
```

### 8.2 pycuda

before installing pycuda, we want to make sure there is absolutely no trace of previous installations left on your machine. So we delete them from the potential locations.

```
$ rm -rf ~/.conda/pkgs/pycuda*  
$ rm -rf ~/.local/lib/python2.7/site-packages/pycuda*
```

Now install `pycuda`

```
$ pip install -Iv pycuda
```

## 9. Clone the repository

```
$ git clone https://github.com/alineu/pygbe.git
```

or

```
$ git clone git@github.com:alineu/pygbe.git  
$ cd pygbe
```

## 10. checkout the asymmetric branch

```
$ git checkout asymmetric
```

## 11. Download and install SWIG

```
$ mkdir src  
$ cd src  
$ wget https://versaweb.dl.sourceforge.net/project/swig/swig/swig-3.0.12/swig-3.0.12.tar.gz  
$ tar -xvzf swig-3.0.12.tar.gz  
$ cd swig-3.0.12  
$ ./configure --prefix=$PWD  
$ make  
$ make install
```

## 12. Install PyGBe and test the installation

### 12.1 Install

```
$ cd ../../bem_pycuda/  
$ make all
```

### 12.2 Test

```
$ python main_asymmetric.py input_files/his.param input_files/his_stern.config --asymmetric --chargeForm
```

If the library is installed properly, you should see something like

```
Run started on:  
  Date: year/m/d  
  Time: hr:min:sec
```

```
Reading pqr for region 2 from ../geometry/his/his_prot.pqr
```

```
Reading surface 0 from file ../geometry/his/his_d01  
Time load mesh: 0.036644  
Removed areas=0: 0
```

```
Reading surface 1 from file ../geometry/his/his_d01_stern
Time load mesh: 0.041806
Removed areas=0: 81
```

```
Total elements : 1555
Total equations: 3110
```

### 13. Whenever you're done:

```
$ conda deactivate
$ conda deactivate
```

twice!

### Note

Next time, when you connect to a GPU compute node you only need to run the following to enable `PyGBe` library:

If you installed Miniconda locally (via [first option](#)):

```
$ source activate miniconda2
```

otherwise,

```
$ module load anaconda2/2018.12
$ conda activate
```

and finally

```
$ conda activate pygbe-env
```