Fall 2019:
Computational and Variational Methods for Inverse Problems
GEO 391/CSE 397/ME 397/ORI 397

Anaconda installation

Anaconda is a free and open-source distribution of the Python and R programming languages for scientific computing that aims to simplify package management and deployment. It is especially convenient when working on several projects that use different versions of the same Python libraries. Instead of manually keeping track of all libraries and their versions, one can simply set up virtual environments, which allows to separate out packages/dependencies that are going to be used from project to project.

To install Anaconda 3, follow the instructions given on the Anaconda webpage https://docs.continuum.io/anaconda/install/. Please make sure to follow the instructions suitable for your system.

Creating environment

As an illustrative example, we will create an environment with all packages required to run the notebook that was shown in class (`Ill_posedness.ipynb`). This notebook uses essential scientific libraries, including numpy, matplotlib, scipy and jupyter notebook. The corresponding environment (you can use any name instead of `env-name`) can be created by running the following command using terminal, or at the anaconda prompt in Windows:[1]

```
conda create -n env-name -c conda-forge numpy matplotlib scipy jupyter
```

To activate the environment, use the following command:

```
conda activate env-name
```

After the environment has been activated, we can start working with the notebook. Navigate to the directory containing the notebook and run the command:

```
jupyter notebook
```

You will see a page in your web browser with the list of available .ipynb files (in this case there will be just one, `Ill_posedness.ipynb`). Click on the file and it will be opened in a new window.

[1] If you are using the anaconda GUI, please follow the instructions on the screen for activation and navigation to the folder.

Resources

- The Conda user guide can be found here:
  https://conda.io/projects/conda/en/latest/user-guide/index.html
  Another useful resource is conda cheat sheet with some useful commands

  https://docs.conda.io/projects/conda/en/latest/user-guide/cheatsheet.html

- Numpy, Scipy, and Matplotlib are three Python packages that offer similar functionality to Matlab:
  http://www.numpy.org/; https://www.scipy.org/, and http://matplotlib.org/

- Jupyter notebooks, a convenient way to write, run, and document Python code using your web browser:
  http://jupyter.readthedocs.io/en/latest/index.html