DEEP LEARNING

Introduction to Jupyter Notebook, Anaconda and Phyton DL Tools

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Scope

✓ **Python** – a modern language often used for AI, CI, KE, and DM computing.

✓ **Jupyter Notebook** – a modern and intuitive programming environment with linked libraries (like Tensorflow, Keras) that allow to effectively process deep learning algorithms and present results quickly.

✓ **Tensorflow and Keras** libraries produced by leading IT companies, like Google, that facilitate and simplify implementation and use of deep learning algorithms and networks.
The Jupyter Notebook:

• is an open-source web application that allows you to create and share documents that contain live code, equations, visualizations, and narrative text;

• includes data cleaning and transformation, numerical simulation, statistical modeling, data visualization, machine learning, and much more.

We will use it to demonstrate various algorithms, so you are asked to install it.

Jupyter in your browser  Install a Jupyter Notebook
Install Jupyter using **Anaconda** with built in Python 3.7+

- It includes many other commonly used packages for scientific computing, data science, machine learning, and computational intelligence libraries.
- It manages libraries, dependencies, and environments with Conda.
- It allows developing and training various machine learning and deep learning models with scikit-learn, TensorFlow, Keras, Theano etc.
- It supplies us with data analysis including scalability and performance with Dask, NumPy, pandas, and Numba.
- It quickly visualizes results with Matplotlib, Bokeh, Datashader, and Holoviews.

And **run it** at the Terminal (Mac/Linux) or Command Prompt (Windows):

```
jupyter notebook
```
My Anaconda Landscape

**Packages**
Get more information on how to upload a Package.

**Notebooks**
Get more information on how to upload a Notebook.

**Environments**
Get more information on how to upload an Environment.

**Projects**
No projects yet. upload one here.

**Favorites**
Favorite some packages, notebooks, and environments to get started!

**Activity Feed**
Welcome to Anaconda Cloud! 19 months and 22 hours ago
Anaconda Cloud allows you to create or distribute software packages.
Getting started: Installing your first package
Getting started: Distributing your first package
It is recommended to install **PyCharm** for Anaconda:
**PyCharm** is a python IDE for Professional Developers

- It includes scientific mode to interactively analyze your data.
Running a Jupyter Notebook in your browser:

- When the Jupyter Notebook opens in your browser, you will see the Jupyter Notebook Dashboard, which will show you a list of the notebooks, files, and subdirectories in the directory where the notebook server was started by the command line "jupyter notebook".

- Most of the time, you will wish to start a notebook server in the highest level directory containing notebooks. Often this will be your home directory.
Start a new Python notebook:

• Clicking New → Python 3

And a new Python project in the Jupyter Notebook will be started:
In the next assignments and examples, we will use the following packages:

- **numpy** is the fundamental package for scientific computing with Python.
- **h5py** is a common package to interact with a dataset that is stored on an H5 file.
- **matplotlib** is a famous library to plot graphs in Python.
- **PIL** and **scipy** are used here to test your model with your own picture at the end.

They must be imported:

```python
import numpy as np
import matplotlib.pyplot as plt
import h5py
import scipy
from PIL import Image
from scipy import ndimage
from lr_utils import load_dataset

%matplotlib inline
```
Let’s start with powerful computations!

✓ Questions?
✓ Remarks?
✓ Suggestions?
✓ Wishes?
3. Holk Cruse, *Neural Networks as Cybernetic Systems*, 2nd and revised edition
5. *Convolutional Neural Network* (Stanford)
9. JUPYTER: [https://jupyter.org/](https://jupyter.org/)