

## Lab 0: Basic Scientific Python and DTFT

Due February 6<sup>th</sup> 2015

The aims of this lab are

- Install a working scientific python environment on your computer
- Basic experience with numpy and image plotting within python notebook
- Look the properties of the DTFT and of some window functions.

For the labs in the class we will use the scientific libraries numpy and scipy of python as a digital signal processing environment. These are very powerful tools and have increasing popularity among the scientific community, ... and most importantly are freely available to all.

We will be heavily using iPython, which is a powerful interactive shell for python. BTW, iPython was created by our own Fernando Perez (<http://fperez.org>) in 2001 while being a graduate student. Fernando is continuing to lead the project today. There is also an active group of python enthusiast on campus, which we recommend that you check out: (<http://fperez.org/py4science>).

We will also heavily use iPython notebook which is a web-based interactive computational environment extension of iPython. In iPython notebooks you can combine code execution, text, mathematics, plots and rich media into a single document. We will provide you with notebooks that will have instructions as well as empty/half empty code boxes for you to do your work in. You will submit the notebook as the report for the lab.

To help you ease your way to scientific python we made a list of resources available on the class website (<http://inst.eecs.berkeley.edu/~ee123/sp15/python.html>).

1. To do this assignment, you will need to install ipython notebook on your machine following the instructions on the class webpage:  
[http://inst.eecs.berkeley.edu/~ee123/sp15/python\\_install.html](http://inst.eecs.berkeley.edu/~ee123/sp15/python_install.html)
2. To start using ipython notebook, go to your desired workspace on the command line and type `ipython notebook` This should bring up a browser showing the ipython dashboard.
3. The first part of the lab requires you to go through the python tutorial notebook shown in the first discussion section. You can download `python_tutorial.ipynb` on the class webpage. To import it to your ipython dashboard, you can either put it directly to your directory or drag and drop to the center of the dashboard and select upload.
4. Download `lab0-dtft.ipynb` file from the class webpage. Open it in iPython notebook and follow the instructions there to finish the lab.