Day 2: RGB and Synesthesia

Python Activity

Hyper-spectral images and Synesthesia

- Learning Objectives
  - Sensorial
    - Be able to identify the hyper spectral components of a pixel based on its “sound”.
  - Technical
    - Usage of python dictionaries.
    - Manipulation of Hyperspectral information.
    - Explore different ways of data compression beyond a single channel.

Activities

1. Hyper-spectral images:
   - Complete the notebook called Explore_Hyperspectral_Image.ipynb.
     - If you don't have all the needed packages try `pip install <package_name>`
   - Understand script Hyperspectral_Synesthesia.py
     - Explore the script.
     - Add more wavelengths/sounds in a single channel.
2. If you have extra time:
   - Work though the TIP worksheets
     - 1. RGB_TIP.ipynb
     - 2. Hyperspectral_TIP.ipynb

Install libraries on your own computer

If you want to try the scripts and notebooks in your own computer you can follow these instructions in Mac:

- Get python and some modules
  - Go to https://www.continuum.io/downloads#osx
  - Download graphical installer python 2.7 version.
  - Open a terminal and type
    - `pip install pygame`
    - `pip install imageio`
    - `pip install pydub`
    - `pip install jupyter`
- Run jupyter notebook:
  - In a terminal type `jupyter notebook`
  - Find and select the desired .ipynb

Some notes on iPython notebooks

Every time you open a notebook the kernel should be Python 2, or Python or Python[default] (it would depend on how many python installation you have and your jupyter config file). If you want to select a kernel go to kernel $\rightarrow$ change kernel $\rightarrow$ and select the correct python version.

If are not familiar with IPython notebooks a couple of minutes of the following video could be useful (after the minute 4:00, before 5:30):

https://youtu.be/irJVUeYIJgU?t=4m

It is about the basics: how to run, stop, change kernels, and have a tour of the interface.