Day 1: RGB and Synesthesia

Exercises

RBG and Synesthesia

- Learning Objectives:
  - Sensorial:
    - Be able to identify the color of a pixel based on its “sound”.
  - Technical:
    - Getting familiar with Python and IPython notebooks.
    - Image manipulations.
    - Improve the code for an easier synesthesia training.

Activities

1. Download the required files:

   https://github.com/ttamayo/Tech_synesthesia.git

2. Intro to Python and RGB:

   A. Fill the notebook called:

      Computation_with_IPython_notebooks.ipynb

3. Intro to Synesthesia:

   A. Fill the notebook called:

      RGB_and_Synesthesia.ipynb

4. Create your own function:

   A. Complete the python script:

      RGB_Synesthesia_EMPTY.py

   B. Change the image and try to guess the color of a region.

      You might want to start with an image with few colors, and gradually increment its complexity.

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.
  - Improve the code for an easier synesthesia training.
  - Explore different ways of data compression beyond a single channel.

Activities

1. Hyper spectral images:
    A. Complete the notebook called:

        Explore_Hyperspectral_Image.ipynb

2. Create your own function:
    A. Explore the script.

    B. Add more wavelengths in a single channel.

    C. Add more channels and modify the current ones.

Notes:

- Files are on a repository in GitHub:

PATH:

Folders:

A. Intro_python

B. Day1_Synesthesia

- You can only save data on C:\Saved Data directory

Install libraries in 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

    1. Go to https://www.continuum.io/downloads#osx
    2. Download graphical installer python 2.7 version.
    3. Open a terminal.
    4. Type:
        - pip install pygame
        - pip install imageio
        - pip install pydub
        - pip install jupyter

- Run jupyter notebook:

    1. In a terminal type:

    jupyter notebook

    It will open the default browser.

    2. Select from the documents the desired file .pynb

- Using IPython.

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 -> change kernel -> 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/irJVUeYlJgU?t=4m.

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

- Run a python script:

    A. In a terminal.

        1. Go to the path where the script is located with the command "cd"
        2. Type:

    python "file".py

If you want to see the code and you don't want to use a text editor such as vim or nano, the next options can work.

    B. In anaconda Navigator App (it was installed with anaconda):

        1. Go to Home (left side panel)
        2. Click on Spider 3, Launch.
        3. Click on the play icon located at the top to run the code.

    C. In sublime:

        1. Get sublime https://www.sublimetext.com/3
        2. Open sublime.
        3. Open the file with python script.
        4. Go to Tools -> Build System and select Python.
        5. Finally to run it, Go to Tools -> Build.