CS 4475 Computational Photography

Introduction

This document will walk through setting up your local development environment or a virtual machine. Setting up your environment will ensure that you have an appropriate version of python installed along with the necessary libraries used in this course. If you are totally new to Python, you can refer to https://docs.python.org/3/tutorial/index.html to understand the basics of Python.

If you are comfortable setting up your environment on your own, feel free to reference the yaml file for the necessary packages to install.

Download Setup files

On Canvas, click on `Files` in the left side menu, select `Python Environment Setup`, and download the following:

- `cs4475_env_setup.pdf` (this file)
- `cp_env.yml`
- `test_env_setup.py`

Note that you can download a zip of this folder by: https://guides.instructure.com/m/4212/l/41998-how-do-i-download-a-folder-in-zip-format-as-a-student

Place these files into a directory (you can call it `student_env_setup`).

Environment setup

These steps will create an environment that you can use specifically for this course. This will isolate the libraries and versions used inside the `cp_env` environment so as to not conflict with any other python installations you may have now or may create in the future.

1. Download and install Miniconda here https://docs.conda.io/en/latest/miniconda.html. Choose the latest installer python version available (this is not necessarily the same as the version of python that will be installed on your machine, which is OK). What is Conda? Conda is an open source package and environment management system. We recommend using Conda since it makes it easy to install and manage different versions of libraries without messing up other environments. You are welcome to use Anaconda instead of Miniconda, see **this page** for more details on the differences:
2. On Windows, open the installed "Conda prompt" to run your commands. On MacOS and Linux, you can just use a terminal window. Change directory (using `cd`) to the location of the directory `student_env_setup` (the directory that contains the files `cp_env.yml`, `test_env_setup.py`, `cs4475_env_setup.pdf` you downloaded from Canvas).
3. Create a conda environment by running the following command in the "Conda Prompt" (Windows) or Terminal (MacOS/Linux):

```
conda env create -f cp_env.yml
```

4. This should create an environment named `cp_env`. Activate it using the following Windows command: `activate cp_env` or the following MacOS / Linux command: `conda activate cp_env`

Since you may have multiple environments installed on your computer, you will need to remember to activate this specific one (`cp_env`) any time you wish to work on code related to this course. If you are working on files in this course while a different environment is active then you may encounter errors because certain packages are missing or their version is incompatible. It is possible to set your terminal up to automatically activate this environment every time you open a terminal, please google or ask us for help if you wish to do this.

Check your installation

Now that you've installed python and created your environment, you're ready to verify that you have everything set up correctly! You can run the script `test_env_setup.py` using your newly installed version of python. It is a simple script that checks the following:

- installed python version
- installed necessary libraries

You can run it by: `python test_env_setup.py`

Note: Be sure to activate your cp_env before running the above command.

PyCharm Setup

You may choose to use any Python IDE including PyCharm, Visual Studio Code, Sublime, Atom, VIM, etc, or you may also use just a plain text editor and a command line. Below are the steps to setup PyCharm and configure it to use the conda environment that we created above.

Please note that the instructions below are for high-level guidance specific to Linux for PyCharm Professional 2020.2. The exact paths or options may differ for you based on your system. You may refer to the provided PyCharm links in the steps if your operating system or PyCharm version is different.

1. Download and setup PyCharm https://www.jetbrains.com/pycharm/download.

2. Open the directory `student_env_setup` in PyCharm https://www.jetbrains.com/help/pycharm/opening-reopening-and-closing-projects.html#opening_projects.

3. Configure PyCharm to use the conda environment created above https://www.jetbrains.com/help/pycharm/conda-support-creating-conda-virtual-environment.html.

    a: Press Ctrl+Alt+S to open the project Settings/Preferences.

    b. In the Settings/Preferences dialog, select `Project <project name> | Python Interpreter`. Click the icon next to the Python Interpreter dropdown and select Add.

    c. In the left-hand pane of the Add Python Interpreter dialog, select Conda Environment.

    d. Select Existing Environment.

    e. Click Select an interpreter and specify a path to the Conda executable in your file system. To see the path of the conda environment in your system, run the command `conda info --envs` and note the path of the `cp_env`. In the Interpreter path on PyCharm, add that path to the cp_env environment, followed by `bin/python`. An example path would be `/home/user/anaconda3/envs/cp_env/bin/python`.

    f. Select the checkbox Make available to all projects

    g. Apply the changes.

4. Now, to run the file test_env_setup.py, right click on it in the Project window in the left and select Run.

Windows users may refer to `https://www.youtube.com/watch?v=1gtHso20YMQ` for installing Miniconda and PyCharm if you face issues.

MacOS users may refer to `https://www.youtube.com/watch?v=yQo1kb0_8EI` for installing Miniconda and PyCharm if you face issues.