Python / Sunpy tutorial for summer students 2022

Installation guide

For the purposes of this presentation, we will be using Anaconda for managing our python distribution and additional packages, jupyter notebooks as our IDE and of course python as our programming language.

1. Installing Anaconda

Should you already have Anaconda installed, skip to step 2.

1.1. Installation under Windows

- Download the Anaconda installer (Python 3.9 version)
- Anaconda is about 3 GB, make sure there's enough disk space available
- Double click the installer to launch
- Click Next
- Read the licensing terms and click "I Agree"
- Select an install for "Just Me" and click Next
- Select a destination folder to install Anaconda and click Next, you can use the default (for example `C:\Users\<user>\anaconda3`)
- Check only "Register Anaconda3 as my default Python 3.9"
- Click the Install button
- Click Next
- Anaconda will ask you to install PyCharm, which is another IDE that we will not use. Click Next to skip
- If the installation was successful, click Finish
- Verify your installation by doing the following:
  - Click Start, search or select "Anaconda Prompt" from the menu (alternatively: search or select "Anaconda Navigator" and launch "Anaconda Prompt" from there)
  - This will open a Terminal in a new window. Enter `conda list`
  - Enter `python`, wait until it is loaded and enter `quit()`
- If any of the above commands lead to errors, refer to step 1.5.

1.2. Installation under Linux

- Download the Anaconda installer for Linux (Python 3.9 version)
- In a terminal enter `bash ~/Downloads/Anaconda3-2022.05-Linux-x86_64.sh` (alternatively `bash <file you just downloaded.sh>`)
- Hit Enter to view license terms, scroll to the bottom and enter "Yes"
- The default path of installation is `/home/<user>/anaconda3`. It is recommended to use this as your install location (but you may enter a different path at this point). Hit Enter.
- It is recommended to initialize Anaconda3 by typing "yes"
- Close the current terminal window and open a new one
- Run the command `conda config --set auto_activate_base False`
- Verify your installation by doing the following:
  - Enter `conda list`
  - Enter `python`, wait until it is loaded and enter `quit()`
- If any of the above commands lead to errors, refer to step 1.5.

1.3. Installation under macOS

- Download the graphical Anaconda installer for macOS (Python 3.9 version)
- Double-click the downloaded file and click continue to start the installation
- Answer the prompts on the Introduction, Read Me, and License screens
- Click the Install button to install Anaconda in your `~/opt` directory (which is recommended, you can click the "Change Install Location" button to install in another location)
- On the Destination Select screen, select Install for me only
- Click Continue

- Anaconda will ask you to install PyCharm, which is another IDE that we will not use. Click Continue to skip
- If the installation was successful, click Close
- Verify your installation by doing the following:
  - Hit Cmd+Space, type either "Anaconda Prompt" or "Anaconda Navigator" and start the program (if you started "Anaconda Navigator", you can launch "Anaconda Prompt" from there)
  - This will open a Terminal in a new window. Enter `conda list`
  - Enter `python`, wait until it is loaded and enter `quit()`
- If any of the above commands lead to errors, refer to step 1.5.

1.4. Updating an existing version of Anaconda

Windows: Open the Start Menu and launch Anaconda Prompt (either by typing it in the search bar, or via Anaconda Navigator)

Linux and macOS: Open a terminal window

- type the following two commands:

```
conda update conda
```

1.5. Troubleshoot

- Refer to https://docs.continuum.io/anaconda/user-guide/troubleshooting/
- or contact me (mwaidele@stanford.edu)

2. Downloading the tutorial repository

All of the material for the tutorial will be located in my GitHub-repository. Although it can be easily viewed and accessed there, it is more convenient to download the whole repository on your local device.

2.2. Downloading via `git` (recommended)

If you have `git` installed, you can clone the repository.

- Make a new directory for the lecture material (for example `~/lectures`)
- In a terminal window, type

```
git clone https://github.com/mwaidele/py_sunpy_SummerStudents_2022.git
```

2.1. Downloading via Browser

- Download my GitHub repo
- Click "Save File"
- Move the downloaded file (should be in your `Downloads/` directory) into any folder you would like to store the lecture material
- Extract all files (double click the .zip file)
- After extraction, rename the folder that was created to `py_sunpy_SummerStudents2022`

3. Setup the lecture environment

In order to make sure all the necessary packages to use `sunpy` are installed, a virtual environment specifically for this tutorial can be installed.

Windows: Open the Start Menu and launch Anaconda Prompt (either by typing it in the search bar, or via Anaconda Navigator)

Linux and macOS: Open a terminal window

- Navigate your directory to the lecture material via (windows):

```
cd <your_dir>\py_sunpy_SummerStudents2022
```

(Linux and macOS):

```
cd <your_dir>/py_sunpy_SummerStudents2022
```

where `<your_dir>` is the folder in which you extracted the .zip file (or cloned the repo into via `git`)

- Type the following command

```
conda config --add channels conda-forge
conda env create -f pyTUT.yml
```

- The installation will take about 10 minutes
- Type

```
conda activate pyTUT
ipython kernel install --user --name=pyTUT
jupyter notebook
```

- Click "Quit" in the upper right in the browser tab that just opened and close the tab
- Type `conda deactivate`

You should be all set up and ready for the tutorial now. If you have any issues, please feel free to contact me (mwaidele@stanford.edu).