



# Software installation instruction for the ‘Control’ sessions of the Topical Lectures ‘Signal Processing and Reconstruction’, 2021

Andreas Freise

*Date:* April 11, 2021

Nikhef - National Institute for Subatomic Physics  
Science Park 105, 1098 XG Amsterdam  
The Netherlands

## Contents

<b>1</b>	<b>Introduction</b>	<b>1</b>
1.1	I am a Python user and have Anaconda/Conda installed already (Windows, macOS, or Linux) .	1
1.2	I am a Python user and have my own environment already set up that I want to use . . . . .	1
1.3	For Windows users without Conda installed . . . . .	1
1.4	For macOS and Linux users without Conda installed . . . . .	2
<b>2</b>	<b>Installing required packages</b>	<b>2</b>
<b>3</b>	<b>Using Jupyter notebook</b>	<b>2</b>
<b>4</b>	<b>Running the notebooks partially online</b>	<b>3</b>

---

## 1 Introduction

This document provides information on getting started for the hands-on session on controls in the topical lectures 2021. Our hands-on session will make use of **Python** and **Jupyter notebook**. The Python ecosystem has to be installed first. The installation instructions below should guide you through the process of installing all the required software packages. If you have questions or need help, you can contact us by email.

### 1.1 I am a Python user and have Anaconda/Conda installed already (Windows, macOS, or Linux)

If you already use Anaconda or Miniconda on your system, then installation is very easy! You can just straight ahead to section 2.

### 1.2 I am a Python user and have my own environment already set up that I want to use

If you have Python already installed on your machine and you are using it regularly for other tasks, you might not want to follow the instructions below, but instead install the required packages directly, if not already present. We will use at least the following packages: matplotlib, jupyter, numpy and scipy.

However, you can install Conda just for the lectures. It will provide an independent Python environment which should not interfere with your existing Python setup.

### 1.3 For Windows users without Conda installed

First download a Python 3.x Miniconda installer from <https://docs.conda.io>. Double click on the \*.exe and follow the instruction on screen. You can just use all default settings given by the installer. Once the Miniconda has been installed, search for **Anaconda Prompt** in the start menu. This could be in the **Anaconda** folder. See Figure 1.

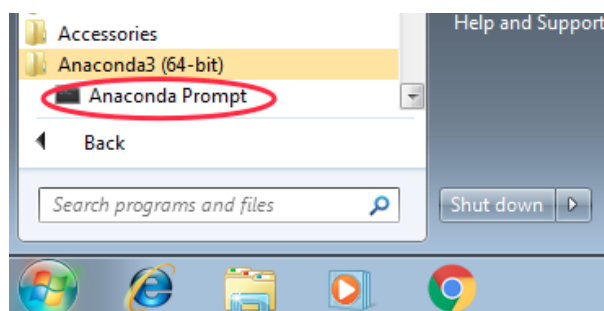


Figure 1

This will open a new command window which can run Conda and Python. Type: `conda list`. If the installation has been successful, you should see a list of installed Conda packages.

Now move on to section 2.

## 1.4 For macOS and Linux users without Conda installed

Download the Miniconda installer for a 3.x version from <https://docs.conda.io>. On macOS you can select the pkg package installer. On Linux download the installer, rename to 'Miniconda3.sh'. Then run the installer and follow the instruction.

The main Conda environment will be activated each time you open a new terminal and will be ready for you to use straight away. You can tell that the environment is activated by the fact that `(base)` should now appear before each line in the terminal. If you want to switch off the environment, simply type `source deactivate`. You can stop the environment from being permanently activated by removing the Conda specific code from the file `~/.profile` or `.bash_profile` (or the equivalent shell script) in your home directory.

## 2 Installing required packages

Note to Windows users: When we say open a Terminal, we mean open Anaconda Prompt from now on.

Open up a new Terminal window use the following commands one after another to install all packages we need:

```
conda update conda
```

Type `y` for yes when asked and wait for the installation complete. Then continue with:

```
conda install matplotlib jupyter numpy scipy
```

Type `y` for yes when asked and wait for the installation complete.

One can see the list of the installed packages with the command `conda list`.

## 3 Using Jupyter notebook

Using Jupyter notebook is a nice way to keep your technical notes with results. The Jupyter notebook should already have been installed on your computer in Section 2.

**For Windows system**, to open the Jupyter notebook, open the **Anaconda Prompt** command window, and type `jupyter notebook`. Or you can also find it in your computer **Start** menu under **Anaconda** folder.

---

For OS X and Linux system, to open the Jupyter notebook, open the **Terminal** window, and type `jupyter notebook`.

The Jupyter notebook will be opened with your default Internet browser. You can go to, or create, your preferred working folder. Press **New** and chose **Python 3** (shown in Figure 2) to create a new notebook.

In order to run the notebooks provided as part of this course, you simply have to open them from within the Jupyter notebook.

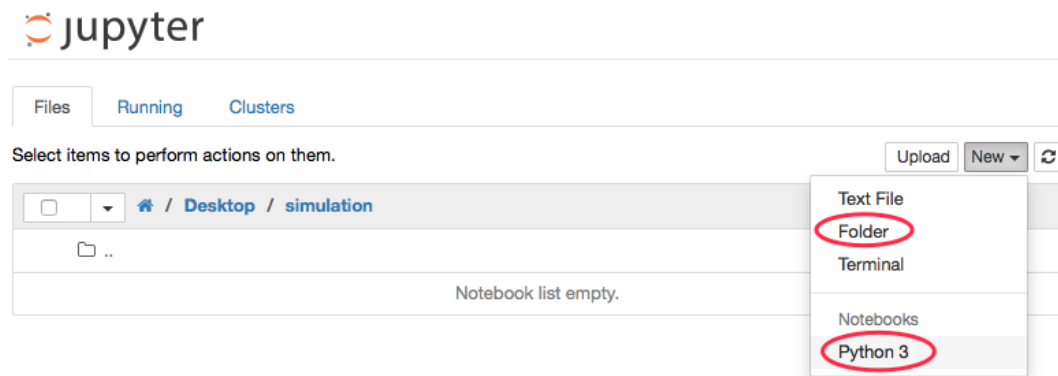


Figure 2

## 4 Running the notebooks partially online

If you cannot install Python and Jupyter locally, you can still work on parts of this project by running the Jupyter notebooks online in Google's Colab project, you only need a Google account.

Unfortunately Colab does not support interactive plots and therefore cannot run the notebooks with the interactive drone flying. However, you can still do the majority of the tasks.

We strongly recommend for you to work with a local Jupyter install but the Colab system is a useful fallback option if that is not possible.