FMIPROT
Finnish Meteorological Institute Image Processing Toolbox

Quick guide for Installation from source code
using virtualenv and pip

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Installation

FMIPROT is developed in Python 2.7 and available as source code and binary for some distributions (latest version only available as source code). For development, Python 2.7 and various libraries are required. Those libraries are Tkinter and the list of libraries with the version numbers in "requirements.txt" in the code repository.

The libraries can be installed on the operation system with other libraries. This is not a good practice because one may need to overwrite the existing libraries for FMIPROT to work, which will cause problems in the other programs and/or libraries and vice versa. It will also require one to set up Python 2 as default interpreter, while Python 3 may be required for other programs one is using. To overcome this potential problem, we will create a virtual environment for FMIPROT, using "virtualenv."

In this guide, "pip" is used as the package manager for the libraries. Instead of "virtualenv" and "pip", "anaconda" and variants can also be used.

Only library that can not be installed with pip in the virtual environment is "Tkinter". We will install this to the system, if necessary. (If you know a way to do this in virtual env., please share with me)

More information about virtual environments can be found at https://realpython.com/python-virtual-environments-a-primer/ (optional)

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Installation
Python 2.7, pip, Tkinter

Linux

By default, Python 2.7 is already installed in most distros of Linux.
Check it by:

```
$ python --version
```

If the output shows the version 2.7, it is already there.
If the output shows version 3.x, default version is 3. But 2.7 can still be installed. Check it by:

```
$ python2 --version
```

If the output shows the version 2.7, it is already there.
If "command is not found" in any of those prompts, it is not installed. (very rare condition)
Install it by using your distro's package manager. In Ubuntu by default:

```
$ sudo apt-get update && sudo apt-get install python
```

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Installation
Python 2.7, pip, Tkinter

Download pip installation script: https://bootstrap.pypa.io/get-pip.py

Switch to the directory where you downloaded the script
```
$ cd path_to_script
```
If your default python version is 2,
```
$ python get-pip.py
```
If your default python version is 3,
```
$ python2 get-pip.py
```

Upgrade pip to latest version,
```
$ pip install --upgrade pip
```

Install Tkinter by using your distro's package manager. In Ubuntu by default:
```
$ sudo apt-get update && sudo apt-get install python-tk
```

Installation
Python 2.7, pip, Tkinter, Visual C++ Compiler for Python

Windows
Download the installer package: https://www.python.org/ftp/python/2.7.15/python-2.7.15.amd64.msi and run it.

- On the first screen, select "Install for all users".
- On the second screen, leave the installation directory as default (" C:\Python27\", if you don't have a problem with it. If you change it, modify following steps accordingly.
- On the third screen, make sure "Tcl/Tk", "pip", "Add python.exe to Path" are selected
- Finish the installation.

Upgrade pip to latest version,
```
C:\> pip install --upgrade pip
```

Download and install Microsoft Visual C++ Compiler for Python 2.7:
https://www.microsoft.com/en-us/download/details.aspx?id=44266

$ -> Command in Linux terminal
C:\> -> Command in Windows command prompt
my_working_dir -> The directory you would like to work in. It can be anywhere.

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Installation virtualenv

Install:
Linux:
`$ pip install virtualenv`

Windows:
`C:\> pip install virtualenv`

Create an environment:
The virtual environment can be created anywhere with any name:

Linux:
If default python version is 2.x:
`$ virtualenv my_working_dir/FMIPROT_env`
If default python version is 3.x:
`$ virtualenv -p python2 my_working_dir/FMIPROT_env`

Windows:
`C:\> virtualenv my_working_dir\FMIPROT_env`

$ -> Command in Linux terminal
C:\> -> Command in Windows command prompt
my_working_dir -> The directory you would like to work in. It can be anywhere.

Installation virtualenv

Activate the environment:
Linux:
$ source my_working_dir/FMIPROT_env/bin/activate

Windows:
C:\>my_working_dir\FMIPROT_env\Scripts\activate

Virtual environment should always be activated before doing anything with FMIPROT, including running it. Otherwise, python will use the system libraries, not the ones in the virtual environment. When the virtual environment is activated, its name will be visible in the command line:
Linux:
(FMIPROT_env) $
Windows:
(FMIPROT_env) C:\>

$ -> Command in Linux terminal
C:\> -> Command in Windows command prompt
my_working_dir -> The directory you would like to work in. It can be anywhere.

Installation
Libraries/Modules

Download FMIPROT repository from the link below and extract it to "my_w
so that "my_working_dir/FMIPROT-milano2018/"
has the directory "src":
https://github.com/tanisc/FMIPROT/archive/milano2018.zip

Install the libraries in "requirements.txt"
Linux:
```
(FMIPROT_env) $ pip install -r my_working_dir/FMIPROT-milano2018/requirements.txt
```

Windows:
```
(FMIPROT_env) C:\>pip install -r my_working_dir\FMIPROT-milano2018\requirements_win.txt
```
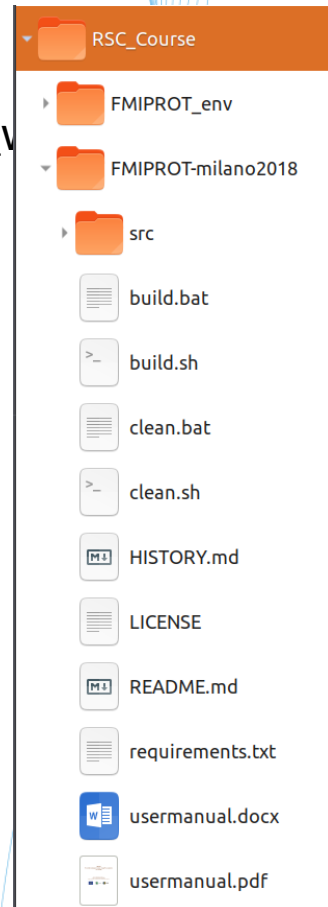
The library "imageio" also requires MPEG codecs to be downloaded:
Linux:
```
(FMIPROT_env) $ python -c "import imageio;imageio.plugins.ffmpeg.download()"
```

Windows:
```
(FMIPROT_env) C:\>python -c "import imageio;imageio.plugins.ffmpeg.download()"
```

RSC_Course
- FMIPROT_env
- FMIPROT-milano2018
  - src
  - build.bat
  - build.sh
  - clean.bat
  - clean.sh
  - HISTORY.md
  - LICENSE
  - README.md
  - requirements.txt
  - usermanual.docx
  - usermanual.pdf

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Installation
Libraries/Modules

Windows:

For Windows, VTK and Polygon2 should be installed from wheel file, because Visual C++ compiler version for those to be compiled is not available for Python 2.7. Download

- https://download.lfd.uci.edu/pythonlibs/r5uhg2lo/VTK-7.1.1-cp27-cp27m-win_amd64.whl
- https://download.lfd.uci.edu/pythonlibs/r5uhg2lo/Polygon2-2.0.8-cp27-cp27m-win_amd64.whl

```
(FMIPROT_env) C:\>python -m pip install path_to_file\VTK-7.1.1-cp27-cp27m-win_amd64.whl
(FMIPROT_env) C:\>python -m pip install path_to_file\Polygon2-2.0.8-cp27-cp27m-win_amd64.whl
```

(path_to_file should be the directory where the file is downloaded)

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$ -> Command in Linux terminal
C:\> -> Command in Windows command prompt
my_working_dir -> The directory you would like to work in. It can be anywhere.

Run FMIPROT

Activate the virtual environment if it is not active already:
Linux:
```
$ source my_working_dir/FMIPROT_env/bin/activate
```

Windows:
```
C:\>my_working_dir\FMIPROT_env\Scripts\activate
```

Run FMIPROT:
Linux:
```
$ cd my_working_dir/FMIPROT-milano2018/src
$ python fmiprot.py
```

Windows:
```
C:\>cd my_working_dir\FMIPROT-milano2018\src
C:\>python fmiprot.py
```

Settings

- 1) Always set up your storage directories for convenience. (e.g. disk space problems)
- 2) Setup your web proxy, if any.