

Installing MAMBA in Ubuntu (11.10, 12.04 LTS) (updated document, May 2012)

This is an update of the previous document explaining how to compile and install Mamba 1.1.1, the latest release of the Mamba image library with Ubuntu 11.10 or 12.04. The main difference comes from the installation of Mamba Realtime, which is simpler as compilation errors (due to a lack of compatibility in the recent versions of the FFmpeg library) have been fixed.

This document is an helper for those of you who would like to use Mamba with Linux but who are newcomers (like me..) to Linux. Many friends and colleagues who are Linux aficionados told you that Linux was faster (and in fact, it should be as its Mamba implementation is in 64 bits). However, contrary to Windows, there is no Mamba installers for the Linux distributions and you must build them by yourself. Indeed, you can find concise instructions to achieve this in the various user manuals but they are quite general (they are supposed to work for all the Linux distributions) and they may seem to be disconcerting if you are a beginner.

Therefore, you will find in this document a step-by-step description to successfully compile and install mamba, mamba3D and mambaRealtime with the latest Ubuntu releases at this time (this procedure has been successfully tested with release 12.04 LTS, Precise Pangolin, with the previous release 11.10, Oneiric Ocelot, Gnome and Lubuntu environments). I have chosen this distribution because it is the one I use :-)) and also because it is supposed to be the preferred distribution by Linux beginners (it's Linux for humans, right?). If you are using another distribution (or a previous Ubuntu release), no doubt that you will be able to adapt these instructions to your needs. The only important point is that you follow accurately these steps and you do not miss one.

Building and installing mamba

- 1) Go to <http://www.mamba-image.org> and download the archive file, Mamba.1.1.1.zip.
- 2) Extract this file (in your home directory for instance). You will have then a new directory entitled Mamba.1.1.1
- 3) Download the Mamba user manual from the documentation page of the web site and read the installation procedure, chapters 5 and 6. The following pieces of software are necessary: GCC, Python, SWIG, TkInter and PIL. GCC (GNU C Compiler) is normally already installed in your Linux distribution. Python (version 2.7 in Ubuntu) is also installed. You can verify this by typing **gcc** and **python** in a terminal window.
- 4) Download and install the packet containing the header files for Python: open the Ubuntu Software Center (USC) and type **python-dev** in the search window. Install the packet (it should be normally proposed by the USC).
- 5) Download and install Tkinter (type **python-tk** in the search window of the USC).
- 6) PIL, the Python Imaging Library should be already installed in your Ubuntu distribution (except if you use Lubuntu). To verify this, type **python imaging library** in the USC search window. The Python Imaging Library (packet **python-imaging**) should appear in the returned list with a tag indicating that it is already installed. If not, install it. Then, in the same list, look for and install **python-imaging-tk**, the ImageTk module of PIL.
- 7) Download and install SWIG (the name of the packet is **swig**). SWIG (Simplified Wrapper and Interface Generator) is a software package which is used to build interfaces between the Mamba core operators (written in C) and their correspondents in Python (version 2.0.4 is the current version of SWIG).

At this point, if nothing has been missed, you should be able to build and install Mamba. To do this, open a terminal window (by launching the Ubuntu terminal application) and follow the next steps (I

assume again that the Mamba archive has been unzipped in the Mamba.1.1.1 sub-directory of your home directory. If not, change the paths names accordingly).

8) Go to the right mamba directory:

```
cd Mamba.1.1.1/src/mambaApi
```

9) Follow the instructions in the user manual (section 6.3) by typing the following command:

```
python setup.py build_ext build
```

You should have a flow of messages pouring in your terminal, finishing, if everything went well, by a message indicating that the build procedure ended normally. If not, check the error messages (they should indicate which part of the procedure is faulty) and make the corrections (most of the time, it is due to a not installed packet).

10) The final step consists simply in installing Mamba by typing the command:

```
sudo python setup.py install
```

Remark that this command must start by **sudo** which is the Ubuntu command to give you administrator privileges. Indeed, Mamba will be installed in the protected part of your Linux system, which is allowed only if you have got administrator rights.

You can test that your installation is OK by entering the following commands:

```
python
```

A python console opens. Then:

```
from mamba import *
```

```
im1 = imageMb()
```

```
im1.showDisplay()
```

A display window should appear showing a black 256x256 image.

Note: You may have some difficulties to find packets with USC. It seems that this packet manager may have sometimes an erratic behavior (there are many discussions and complaints about this software in the various Ubuntu forums). If it is the case, you can use the old packet manager, named *synaptic* instead (it is not installed in the Ubuntu releases, but it is present in Lubuntu). You can download and install it with... USC.

Building and installing mamba3D

Building and installing Mamba3D is as easy as it was for mamba. Follow these successive steps:

1) Download the Mamba 3D user manual from the Mamba web page and read the installation procedure. Apart from GCC, Python, SWIG and Mamba which are already installed, you will need to install VTK and its Python bindings if you want to use the Mamba3D integrated display. VTK (Visualisation Tool Kit) is a library used by Mamba3D for 3D display.

2) Download and install VTK (enter *libvtk* in the USC search window). The packet is currently named *libvtk5.6*.

3) Download and install the Python bindings for VTK. This packet is named *python-vtk*.

4) Open a terminal window and go to the Mamba3D directory:

```
cd Mamba.1.1.1/src/mambaAddons/mamba3D
```

5) Enter the following command:

```
python setup3D.py build_ext build
```

6) The final step consists simply in installing Mamba3D by typing the command:

```
sudo python setup3D.py install
```

You can test that your installation is OK by entering the following commands:

```
python
```

A python console opens. Then:

```
from mamba import *  
from mamba3D import *  
im1 = image3DMb()  
im1.showDisplay()
```

A VTK display window should appear showing an empty 256x256x256 3D image.

Building and installing mambaRealtime

Building and installing this module is also straightforward with the new Mamba 1.1.1 release. Problems which occurred with the previous release have been fixed. These problems were due to the FFmpeg library used in this module. This library is evolving rapidly and different forks of it have appeared. As a result, the upward compatibility is not assured and some compilation errors appeared during the build procedure.

1) Go to the mambaRealtime directory (*Mamba.1.1.1/src/mambaAddons-restricted/realtime-linux*) and read the readme.txt file. This file lists the needed tools: GCC, SWIG (both are already installed), the SDL library, the libv4l2 library (video for Linux) and the FFmpeg library (libavcodec, libavformat, libswscale, ...).

2) Download and install the SDL library (type *libsdl* in the USC. If no result appears, search among *developer tools*, then *libraries*). You need the following packets: *libsdl1.2-dev* and *libsdl-image1.2-dev*.

3) Download and install the video for Linux library. Two packets are necessary: *libv4l-0* which should be already installed and *libv4l-dev*.

4) Download and install the FFmpeg library. The name of the packet is *ffmpeg*. The current available release should be 0.8.1 in the Ubuntu repository.

5) Download and install the following packets: *libavutil-dev*, *libavdevice-dev*, *libavfilter-dev*, *libavformat-dev*, *libavcodec-dev* and *libavswscale-dev*. It is not sure that all of them be needful, it's just in case...

6) At this point, you should be able to build the mambaRealtime distribution by entering in a terminal:

```
python setupRT.py build_ext build
```

7) Finish the procedure by:

```
sudo python setupRT.py install
```

Note that the two last commands do not correspond exactly to those which are given in the readme.txt file. These latter ones are simpler to use.

You can test this installation by opening a Python console and entering:

```
from mambaRealtime import *
```

Have a look to the Mamba Realtime Reference manual for further information.

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