

Integration Option 1 (Working)

Objective: Install Blender and make sure Blender recognizes Bertini_real

1. Make sure you're using Python 3.7 (if not, install or update to the latest version)

Installation:

MacOS: `brew install python3`

Linux: `sudo apt install python3.7`

2. Install Blender 2.8 (latest version which uses Python 3.7 interpreter)

Download and install Blender 2.8: <https://www.blender.org/2-8/>

3. Add Blender to PATH

Example:

MacOS: `echo "alias blender=/Applications/blender2.8/blender.app" >> ~/.bashrc`

Linux: `export PATH:$PATH:/home/foongminwong/blender2.8/blender`

4. Install python packages required by Bertini_real into Blender Python Modules Folder in your local terminal: (use the latest version pip for Python 3.7)

Example:

MacOS: `pip3 install -t /Applications/blender2.8/blender.app/Contents/Resources/2.80/scripts/modules <python-package-name> --upgrade`

Linux: `pip3 install -t /home/foongminwong/blender2.8/2.80/scripts/modules <python-package-name> --upgrade`

(If the commands don't work, add option '--system')

List of python package names:

| | | | | |
|----------|------------|---------|---------|--------|
| dill | matplotlib | sympy | scipy | numpy |
| algopy | mpmath | trimesh | shapely | cython |
| pyopengl | triangle | glumpy | pillow | |

5. To export video, you can run Blender in background with the Python automation script in your local terminal:

Command: `blender -b -P <python-script.py>`

Example: `blender -noaudio -b -P ~/bertini_real/python/bertini_real/anaglypy/rotate_z.py`

For more information about the Blender Python commands, check [this](#) out.

Or inside Blender Python console 3.7.0:

Command Example:

```
>>> filename = /home/foongminwong/bertini_real/python/bertini_real/anaglypy/rotate_z.py #name of python script
```

```
>>> exec(compile(open(filename).read(),filename,'exec'))
```

Extra: If errors come up, try the following:

- Install & upgrade all aforementioned python packages in your own local system:
`pip3 install <python-package-name> --upgrade`
- For Linux, if you get error: "command 'x86_64-linux-gnu-gcc' failed with exit status 1", try running this command: `sudo apt-get install python3.7-dev` or try [this](#)
- If you get errors such as "pickle.load – EOF Error: Ran out of input" related to pickle, try running "`pip 3 install dill pillow --upgrade`"
- If you get errors such as "DistutilsOptionError: can't combine user with prefix, exec_prefix/home, or install_(plat)base, try [this](#)

Integration Option 2 (Not working for me)

Objective: Install BlenderAsPyModule

1. **Make sure you're using Python 3.7 (if not, install or update to the latest version)**
python version must align with the python version in blender

2. **Install bpy (from source)** – This will take some time. Use “sudo” when necessary.

Link: <https://archive.blender.org/wiki/index.php/User:Ideasman42/BlenderAsPyModule/>

Link: https://wiki.blender.org/wiki/Building_Blender/Linux/Ubuntu

3. **Install bpy (using pip)** – This doesn't seem working. It only works for Windows for now.

Link: <https://pypi.org/project/bpy/>

4. **Use 'anaglypy' module** (if bpy is installed correctly in your machine, else you will get seg fault):
IPython:

```
>>> import bertini_real
>>> bertini_real.fata.gather() # if user hasn't gathered yet
>>> bertini_real.anaglypy. [option]
[1] rotate_z()
[2] rotate_xyz()
[3] multi_rotate()
```