

Command Line Utilities

Command Line Set-Up Instructions

Your OpenSim download includes command line executables that can run all of the OpenSim tools, including OpenSense for IMU-based kinematics (as of version 4.1).

After you have installed OpenSim, you need to tell your system where to find the command line tools by adding their folder to your system's path.

Mac, using the bash shell

On Mac, you should add a shortcut to opensim-cmd and/or to opensense. You can do this by running the script provided:

- Launch a terminal window and navigate to the "bin" folder that is contained in the folder where you installed OpenSim. For example, if you installed OpenSim in "Applications/OpenSim 4.1" you would type:

```
cd /Applications/OpenSim\ 4.1/bin
```

- Then, run the included set-up script by typing the following. You may be prompted to enter your password:

```
./opensim-install-command-line.sh
```

From then on, you can refer to opensense and opensim-cmd from anywhere on your Mac.

To test if the OpenSim command line tools are now on your path, type in "opensim-cmd" at the command prompt from any directory. A set of instructions for using opensim-cmd should be printed to the Terminal window. You can test the opensense command line tools similarly.

Alternately, you can do the set-up manually by following the steps below:

- Launch a terminal window and type "cd /usr/local/bin/".
- Then type:

```
ln -s <OpenSim Installation Folder>/bin/opensense opensense  
ln -s <OpenSim Installation Folder>/bin/opensim-cmd opensim-cmd
```

The "/usr/local/bin" folder may be write-protected, in which case you need to prefix these lines with "sudo ". For example, if you have installed OpenSim 4.1 in the folder "/Applications/OpenSim", you would type:

```
sudo ln -s /Applications/OpenSim\ 4.1/bin/opensim-cmd opensim-cmd  
sudo ln -s /Applications/OpenSim\ 4.1/bin/opensense opensense
```

Note that the backslash before the 4.1 allows the terminal shell to correctly interpret the space in the name of the "OpenSim 4.1" folder.

From then on, you can refer to opensense and opensim-cmd from anywhere on your Mac.

To test if the OpenSim command line tools are now on your path, type in "opensim-cmd" at the command prompt from any directory. A set of instructions for using opensim-cmd should be printed to the Terminal window. You can test the opensense command line tools similarly.

If you remove an installation or install a new version of OpenSim, remember to update or remove these links:

- Navigate to /usr/local/bin as previously
- Type "rm opensense"
- Type "rm opensim-cmd"
- Repeat the steps above for your new version of OpenSim.

[You can learn more about your bash profile and how to edit it here.](#)

Starting with macOS 10.15 Catalina, the default command-line shell is **zsh** instead of **bash**. See <https://support.apple.com/en-gb/HT208050> for details.

Windows

On Windows, you also need to add the path to OpenSim executables and dynamic libraries to your system path by performing the following steps:

- Go to your Settings-> Edit Environment Variables for your account (you can type "env" in the search box on Windows 10).

- The top half of the window that appears will show the list of user variables. Edit the variable named "Path" by choosing Path from the list of variables. To do this, Press **Edit...**, then add the location of the OpenSim "bin" folder (e.g., C:/OpenSim 4.1/bin) to the list of folders to search. When you are finished, hit OK.

Executing command line utilities

OpenSim contains a command line executable that can run all of the OpenSim Tools. This executable takes as input the same setup (or settings) file loaded into or saved from the OpenSim GUI application. For example, to perform Inverse Kinematics from the command line (the Command Prompt in Windows, or the Terminal on macOS), one can execute the following command:

```
opensim-cmd run-tool arm26_Setup_InverseKinematics.xml
```

The same command can be used to run CMC or any other tool (the specific OpenSim Tool to run is determined based on the provided setup file). The command line executable is located in <OpenSim_Install_Dir>/bin (on Windows, this directory also contains deprecated executables named "ik", "id", "cmc", etc.).

The command line executable can do more than run OpenSim Tools. You can generate template XML files for tools or modeling components (*opensim-cmd print-xml*) and update an XML file to the latest version (*opensim-cmd update-file*). Lastly, the command *opensim-cmd info* can be a very handy resource to obtain information about Tools and Components, including the XML tags needed in the model and/or setup file. This is the same information listed in the "XML Browser" panel under the Help menu in the OpenSim GUI. Executing *opensim-cmd info* without any other arguments lists all the registered classes (components, analyses, utilities and tools) available in OpenSim. For more information about a particular object, such as adding a point constraint to the model, executing

```
opensim-cmd info PointConstraint
```

yields:

```
PROPERTIES FOR PointConstraint (5)
1. components
2. isEnforced
3. socket_body_1_connectee_name
4. socket_body_2_connectee_name
5. location_body_1
6. location_body_2
```

This list describes the properties used to define a point constraint in OpenSim.

Just like the GUI, the command line executable also allows loading OpenSim plugins (via the *--library* argument).

Use *opensim-cmd --help* for more information and examples on how to use the command line executable.

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