**OGRE installation guide –** Last updated August 7, 2025

This file lists all of the installation prerequisites for OGRE on Mac and Linux. These instructions are written for Mac: OGRE will require the same components for either operating system (unless otherwise noted), but Linux may require different installation processes/commands. Linux was tested using WSL-Ubuntu.

**Basics**

**Command Line Tools (Mac only)**:

If you are sitting at the machine, then in the terminal

% xcode-select --install

If you are working remotely, such as from MobaXterm

% touch /tmp/.com.apple.dt.CommandLineTools.installondemand.in-progress;

% PROD=$(softwareupdate -l | grep "\\*.\*Command Line" | tail -n 1 | sed 's/^[^C]\* //')

% softwareupdate -i "$PROD" --verbose;

If you subsequently update the operating system, then

% xcode-select -p

will return the active developer directory (eg /Library/Developer/CommandLineTools), but don’t be fooled, the Command Line Tools may still need to be reinstalled.

**Homebrew (Mac only):** <http://brew.sh>

% PATH=/opt/homebrew/opt:$PATH

% brew install coreutils

To set up your zsh environment to use homebrew, from your home directory:

% echo 'eval "$(/opt/homebrew/bin/brew shellenv)"' > .zshrc

**Python**:

Install via homebrew:

% brew install python

Alternatively, install from python.org/downloads

% python3 -V # check your python version

% which python3 # where you’re getting it from

Ex. At python.org, right click on the “macOS 64-bit universal2 installer” and “copy link address”.

% curl -O <https://www.python.org/ftp/python/3.12.2/python-3.12.2-macos11.pkg>

% sudo installer -pkg ./python-3.12.2-macos11.pkg -target /

Either way, pdf2scanlist.py requires pdfreader

% pip3 install pdfreader

You will also need to build OGRE's internal python libraries

% cd [location]/OGRE-pipeline/lib/PY

% bash setup.sh

**Git:** % brew install git

**FSL:** <https://fsl.fmrib.ox.ac.uk/fsl/fslwiki/FslInstallation>

**jq (Linux only)**: sudo apt install jq

**Upgrade BASH (Mac only):** <https://itnext.io/upgrading-bash-on-macos-7138bd1066ba>

* The “vim” step is annoying but for basic vim navigation see <https://opensource.com/article/19/3/getting-started-vim> , Step 2
* Final step (chsh -s /opt/homebrew/bin/bash) may need to be completed by all users
* Alternatively, for users who wish to keep the native zsh

Create softlinks in /usr/local/bin

sudo ln -s /opt/homebrew/Cellar/bash/<version>/bin/bash /usr/local/bin

sudo ln -s /opt/homebrew/Cellar/bash/<version>/bin/bashbug /usr/local/bin

Ex. sudo ln -s /opt/homebrew/Cellar/bash/5.2.12/bin/bash /usr/local/bin

sudo ln -s /opt/homebrew/Cellar/bash/5.2.12/bin/bashbug /usr/local/bin

Usage: At the top of your bash scripts use the shebang

#!/usr/local/bin/bash

or

#!/usr/bin/env bash #this may or may not be equivalent to the above

**Freesurfer:** <https://surfer.nmr.mgh.harvard.edu/fswiki//FS7_mac> (**used by OGRE. Versions 5.3.0-HCP, 7.2.0, 7.3.2, 7.4.0 and 7.4.1 have all been implemented in the pipeline)**

Download

% curl -O <freesurfer URL>

Ex. % https://surfer.nmr.mgh.harvard.edu/pub/dist/freesurfer/7.4.1/freesurfer-macOS-darwin\_x86\_64-7.4.1.tar.gz

Install

% sudo tar -C <where to install> -zxvpf <downloaded file>

Ex. % sudo mkdir -p /Applications/freesurfer # create folder if it doesn’t exist

% sudo tar -C /Applications/freesurfer -zxvpf freesurfer-macOS-darwin\_x86\_64-7.4.1.tar.gz

Rename so this version is not crushed by a future version.

% sudo mv /Applications/freesurfer/freesurfer /Applications/freesurfer/<version>

Ex. % sudo mv /Applications/freesurfer/freesurfer /Applications/freesurfer/7.4.1

License: <http://surfer.nmr.mgh.harvard.edu/registration.html>

% sudo mv license.txt /Applications/freesurfer/<version>

Ex. % sudo mv license.txt /Applications/freesurfer/7.4.1

**qt** (**used by Tim Coalson’s CiftiLib which is used by OGRE)**

Change permissions. This line of code was provided by brew itself after first attempting the install command.

sudo chown -R $(whoami) /opt/homebrew

Install

/opt/homebrew/bin/brew install qt<version>

Ex. /opt/homebrew/bin/brew install qt@5

**OpenMP (by OGRE and Tim Coalson’s CiftiLib. Freesurfer also has OpenMP capability, so you might not need to install this separately)**

Install

/opt/homebrew/bin/brew install llvm

/opt/homebrew/bin/brew install libomp

**Boost (used by Tim Coalson’s CiftiLib which is used by OGRE)**

Install

/opt/homebrew/bin/brew install boost

**pkgconfig (used by cmake and CiftiLib which are used by OGRE)**

Install

/opt/homebrew/bin/brew install pkg-config

**cmake (used to build Tim Coalson’s CiftiLib and also used to build OGRE)**

Install

/opt/homebrew/bin/brew install cmake

**pdfreader (used by the optional "pdf2scanlist" tool to read XNAT screenshots)**

Install

pip3 install setuptools

If this doesn't work, try

pip3 install pdfreader --break-system-packages

**Connectome Workbench**

Included as part of the OGRE download, but may be independently acquired from <https://www.humanconnectome.org/software/get-connectome-workbench>

Troubleshooting: for some versions of Mac OS, you may need to permanently bypass security via the following process, for each wb\_XX file in the bin\_macos64X folder:

Double click it to open it. You will get an error message.

System Preferences > Security > General.

“Open Anyway” button. Confirm by hitting “open”

**dcm2niix**

**Converts dicom files to nifti format. Note that FSL includes dcm2niix in /usr/local/fsl/bin. You can check to see if it is the latest release.**

% /usr/local/fsl/bin/dcm2niix

Compare to <https://github.com/rordenlab/dcm2niix/releases> where you can also download the latest release if the FSL version is out of date. Use the installer package.

**Update .bash\_profile/.zshrc**

There are a variety of ways to set up your environment. If you work within the bash shell, you may wish to add variables to your .bash\_profile. If instead you work within mac’s native z shell, you may wish to create a .zshrc. Here is a rough example of a.bash\_profile or .zshrc. Make sure to update the paths for your machine.

umask 002 #Folder permissions rwxrwxr-x

export FSLDIR=/usr/local/fsl #Set location of FSL

. ${FSLDIR}/etc/fslconf/fsl.sh #Set FSL environment including PATH

export OGREDIR=/Users/Shared/Documents/GitHub/OGRE-pipeline # OGRE folder

export PATH=$PATH:$HCPDIR #Add homebrew, pipeline and HCPDIR to PATH

Freesurfer variables may also be added:

export FREESURFDIR=/Applications/freesurfer #Set location of Freesurfer installations

export FREESURFVER=7.4.1 #Currently we are using Freesurfer 7.4.1

export FREESURFER\_HOME=$FREESURFDIR/$FREESURFVER #Set FREESURFER\_HOME

source $FREESURFER\_HOME/SetUpFreeSurfer.sh

PATH=$PATH:$FREESURFER\_HOME/bin #Add location of Freesurfer binaries to path

Variables set via the script options will override those made in the .bash\_profile or .zshrc.

If you are find that that FSL/FEAT runs very slowly on your mac due to the "film\_gls" process taking forever (this is true on our M2 but not our M1), add the following line to your .zshrc:

export OPENBLAS\_NUM\_THREADS=1

We recommend adding the following line to the BOTTOM of your profile. It will ensure that your system looks for scripts first in the homebrew & core installation directories. Without this, python calls may accidentally invoke FSL’s internal version of python instead of your system-wide version.

export PATH="/opt/homebrew/bin:/usr/local/bin:/usr/local/sbin:~/bin:/usr/bin:$PATH"