1. **Install Ubuntu 22.04** 
   1. Requires Flashdrive
   2. <https://ubuntu.com/tutorials/install-ubuntu-desktop#1-overview>
2. **Download CUDA toolkit 11.7**
   1. https://developer.nvidia.com/cuda-downloads
      * 1. Linux
        2. x86\_64
        3. WSL\_Ubuntu
        4. 2.0
        5. deb (network)

*wget https://developer.download.nvidia.com/compute/cuda/repos/wsl-ubuntu/x86\_64/cuda-keyring\_1.0-1\_all.deb*

*sudo dpkg -i cuda-keyring\_1.0-1\_all.deb*

*sudo apt-get update*

*sudo apt-get -y install cuda*

1. **Install NVIDIA\_GDS**
   1. *sudo apt-get install nvidia-gds*
2. **Download CUDA toolkit 9.1**
   1. <https://developer.nvidia.com/cuda-91-download-archive>

*cd ~/Downloads*

*sudo wget http://developer.download.nvidia.com/compute/cuda/repos/ubuntu1704/x86\_64/cuda-repo-ubuntu1704\_9.1.85-1\_amd64.deb*

*sudo dpkg -i cuda-repo-ubuntu1704\_9.1.85-1\_amd64.deb*

*sudo apt-key adv --fetch-keys https://developer.download.nvidia.com/compute/cuda/repos/ubuntu1704/x86\_64/7fa2af80.pub*

*sudo apt-get update*

*sudo apt-get install cuda-9.1*

1. **Add CUDA path to .profile**

*cd ~*

*echo '#'CUDA setup >> .profile*

*echo export PATH=/usr/local/cuda/bin'${PATH:+:${PATH}}' >> .profile*

*echo export LD\_LIBRARY\_PATH=${LD\_LIBRARY\_PATH}:/usr/local/cuda/lib64 >> .profile*

1. **Make symbolic link**

*sudo ln -s /usr/local/cuda-9.1 /usr/local/cuda*

1. **Download MATLAB**
   1. https://www.youtube.com/watch?v=ZNHJkCo5sOc&t=221s
2. **Download Github Desktop**

*cd ~/Downloads*

*wget https://github.com/shiftkey/desktop/releases/download/release-2.9.3-linux3/GitHubDesktop-linux-2.9.3-linux3.deb*

*sudo apt-get install gdebi-core*

*sudo gdebi GitHubDesktop-linux-2.9.3-linux3.deb*

1. **Clone allen’s github**
   1. Open github desktop
   2. Ctr + Shift + O
   3. URL tab
   4. Paste ‘github.com/allengw123/Bonilha’
2. **Download FSL (https://fsl.fmrib.ox.ac.uk/fsl/fslwiki/FslInstallation/Linux)**

*cd ~/Downloads*

*wget https://fsl.fmrib.ox.ac.uk/fsldownloads/fslinstaller.py*

*python3 ./fslinstaller.py*

1. **Overwrite bedpostx\_gpu with CUDA 9.1 version (https://users.fmrib.ox.ac.uk/~moisesf/Bedpostx\_GPU/Installation.html)**

*cd ~/Downloads*

*wget* [*http://users.fmrib.ox.ac.uk/~moisesf/Bedpostx\_GPU/FSL\_6/CUDA\_9.1/bedpostx\_gpu.zip*](http://users.fmrib.ox.ac.uk/~moisesf/Bedpostx_GPU/FSL_6/CUDA_9.1/bedpostx_gpu.zip)

*unzip ./bedpostx\_gpu.zip*

*sudo cp -a /bin/. $FSLDIR/bin/*

*sudo cp -a /lib/. $FSLDIR/lib/*

1. **Reboot system**

*sudo reboot*

1. **Test GPU enabled calculations (**[**https://github.com/neurolabusc/gpu\_test**](https://github.com/neurolabusc/gpu_test)**)**
   1. Download files

*cd ~/Downloads*

*wget* [*https://github.com/neurolabusc/gpu\_test/archive/refs/heads/master.zip*](https://github.com/neurolabusc/gpu_test/archive/refs/heads/master.zip)

*unzip ./gpu\_test-master*

* 1. Run btest (tests bedpost\_gpu)

*~/Downloads/gpu\_test-master/btest/runme\_gpu.sh*

* 1. Run ptest (test probtrackx2\_gpu)

*~/Downloads/gpu\_test-master/ptest/ runme\_gpu.sh*

1. **Download Anaconda (**[**https://docs.anaconda.com/anaconda/install/linux/**](https://docs.anaconda.com/anaconda/install/linux/)**)**

*apt-get install libgl1-mesa-glx libegl1-mesa libxrandr2 libxrandr2 libxss1 libxcursor1 libxcomposite1 libasound2 libxi6 libxtst6*

*cd ~/Downloads*

*sudo wget* [*https://repo.anaconda.com/archive/Anaconda3-2022.05-Linux-x86\_64.sh*](https://repo.anaconda.com/archive/Anaconda3-2022.05-Linux-x86_64.sh)

*sh Anaconda3-2022.05-Linux-x86\_64.sh*

* Type ‘yes’ – to agree license
* Press enter --- to use default install path
* Type ‘yes’ – to run conda int

1. **Download MRtrix3 from anaconda**

*conda install -c mrtrix3 mrtrix3*

1. **Install R**

*sudo apt install dirmngr gnupg apt-transport-https ca-certificates software-properties-common*

*sudo apt-key adv --keyserver keyserver.ubuntu.com --recv-keys E298A3A825C0D65DFD57CBB651716619E084DAB9*

*sudo add-apt-repository 'deb* [*https://cloud.r-project.org/bin/linux/ubuntu focal-cran40/*](https://cloud.r-project.org/bin/linux/ubuntu%20focal-cran40/)*'*

*sudo apt install r-base*

1. **Install brainageR r packges**
   1. Open new instance of terminal

*sudo R*

*install.packages(“kernlab”)*

*install.packages("remotes")*

*remotes::install\_github("jonclayden/RNifti")*

*install.packages("stringr")*

**REMOVED STEPS**

**Overwrite FSL file with fsl\_sub (**[**https://github.com/neurolabusc/fsl\_sub**](https://github.com/neurolabusc/fsl_sub)**)**

*cd ~/Downloads*

*wget* [*https://github.com/neurolabusc/fsl\_sub/archive/refs/heads/master.zip*](https://github.com/neurolabusc/fsl_sub/archive/refs/heads/master.zip)

*unzip ./master.zip*

*cd $FSLDIR/bin*

*sudo cp fsl\_sub fsl\_sub\_orig*

*sudo cp ~/Downloads/fsl\_sub-master/fsl\_sub fsl\_sub*

*sudo chmod o+rx fsl\_sub*