IMG_PIPE GUIDE

Hello future brain enthusiasts. This guide will show you how to set up and use the data analysis pipeline we use for electrode localization, img_pipe.

The original article (Hamilton et al., 2017) can be downloaded from here:
https://www.frontiersin.org/articles/10.3389/fninf.2017.00062/full
(download the PDF version). This article contains straight forward instructions as to set up and use the pipeline. However, this guide will make the setup process much easier for Google Cloud.

Setting up the VM:
Use the following guide to set up the vm, but with these changes:
https://cloud.google.com/solutions/chrome-desktop-remote-on-compute-engine
Use compute optimized, 16 core computer
Under Debian select configure, and set it to 512gb ssd (or whatever size you need)

Installing things:
Either open a console using the GUI or click 'SSH' next to the VM on the compute page.

We can create a bash script to install things easily.
Type:
nano install_req.sh
Then copy and paste the following:

```
sudo apt-get -y update
sudo apt-get -y install gcc
sudo apt-get -y install g++
sudo apt-get -y install libXt*
sudo apt install -y libgl1-mesa-glx
sudo apt-get install -y libglu1-mesa
sudo apt-get install -y libsm6 libxext6 libxrender-dev
sudo apt-get install -y csh
sudo apt-get install -y tcsh
sudo apt-get install -y wget
sudo apt-get -y install git
echo "LC_ALL=en_US.UTF-8" >> /etc/environment
echo "en_US.UTF-8 UTF-8" >> /etc/locale.gen
echo "LANG=en_US.UTF-8" > /etc/locale.conf
sudo locale-gen en_US.UTF-8
sudo reboot
```

Ctrl + s to save, ctrl + x to exit
Finally, type *bash install_req.sh*
This will reboot the system. Open it back up

To install boost,
wget http://sourceforge.net/projects/boost/files/boost/1.41.0/boost_1_41_0.tar.gz
tar -zxvpf boost_1_41_0.tar.gz

Installing Anaconda:
Type or copy the following into the VM prompt:
wget https://repo.continuum.io/archive/Anaconda3-2018.12-Linux-x86_64.sh (we are purposefully using an old version of anaconda)
Once the file finishes downloading, run the following:
bash Anaconda3-2018.12-Linux-x86_64.sh
Go through the prompts and allow it to install. When asked if you want the installer to initialize Anaconda in .bashrc, enter 'yes'
You should not install VSCode if prompted. Now you have installed Anaconda. Wow!
You can remove the install file using 'rm Anaconda3-2018' and press TAB to complete the file name, then enter to remove file.

Installing Freesurfer:
We're using **Freesurfer 7**
Download the appropriate version of Freesurfer from this page: https://surfer.nmr.mgh.harvard.edu/fswiki/rel7downloads
We want to download the .tar file. You will have to use wget to download the correct version. For example:
wget https://surfer.nmr.mgh.harvard.edu/pub/dist/freesurfer/7.1.0/freesurfer-linux-centos8_x86_64-7.1.0.tar.gz

To install:
tar -zxvpf freesurf *press TAB to autofill to correct freesurfer version*
You can remove the Freesurfer install file similarly to the Anaconda install file.
We will now set up some system variables…

Type: *nano ~/.bashrc*
Scroll to the bottom using arrow key, and paste the following. This is assuming you installed freesurfer to the $HOME directory:

```
export FREESURFER_HOME=''$HOME/freesurfer''
source $FREESURFER_HOME/SetUpFreeSurfer.sh
export SUBJECTS_DIR=''$FREESURFER_HOME/subjects''
export DYLD_FALLBACK_LIBRARY_PATH=''/usr/lib:$DYLD_LIBRARY_PATH''
```

Press ctrl+s to save and ctrl+x to exit
Now enter:
source ~/.bashrc

Your freesurfer install is complete!!! Fantastic.
Reboot the system using: *sudo reboot*

Installing img_pipe:
Install git:
sudo apt-get install git
Install img_pipe
git clone https://github.com/changlabucsf/img_pipe

conda env create -f img_pipe/environment_py27.yml

To activate the environment, you will always have to type before entering the Python console:
source activate img_pipe_py2.
img_pipe installed!

Let's upgrade pip and matplotlib:
pip install --upgrade pip
pip install --upgrade matplotlib

Using img_pipe:
From here on out you will be using the paper. We have left off on page 5, at 'Running img_pipe requires…"
I recommend using the test_subject they provide.

If/when you get an error like: "ICE default IO error handler doing an exit(), pid = 7263, errno = 32":
Delete ~/.Xauthority and ~/.ICEauthority and then reboot.

Converting from DICOM to nii with dcm2nii.
sudo apt-get install mricron
To convert:
*dcm2nii -a y -o *output directory* *input directory**

Good luck