***PhAT Analysis Protocol – CAS Extract Compatible***

PhAT is an open-source, GUI-based fiber photometry analysis toolkit generated by the Donaldson Lab, CU Boulder. This document will give a brief overview of downloading and setting up PhAT on your computer. For See <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10054971/#S20> for further details and instructions for using PhAT for analysis.

Before starting make sure to have Python and Anaconda Navigator installed on your computer.

Bolded text indicates what should be typed verbatim into terminal, red text indicates an area where you may need to replace the text with something specific to your computer.

**Installing PhAT (Mac, Conda, Jupyter Lab)**

*Download Code*

1. Navigate to <https://github.com/donaldsonlab/PhAT>, click on green “Code” button then “Download ZIP”
   1. Save zip file locally to device, not on a cloud environment.
2. Unzip file, open PhAT-main folder.
3. Hold Option key and right click on PhAT-Main folder, click “Copy ‘PhAT-Main’ as Pathname’”

*Create Virtual Environment*

1. Open a new terminal window (Command + Space, search ‘terminal’)
2. Enter: **cd /Users/castine/Desktop/PhAT-main**
   1. Replace the text in red with your pathname copied from step 3 above
3. Enter: **conda create -n my\_gui\_env python=3.11 pip**
   1. Note: PhAT is not compatible with Python versions 3.12+, recommended to use 3.11 or 3.10.
4. Enter: **conda activate my\_gui\_env**
   1. Going forward this environment will exist on your computer. ALWAYS activate this environment first thing when using terminal to do anything with PhAT.
5. Enter: **pip list**
6. Enter: **pip install -r requirements.txt**
   1. You should see some sort of success statement that requirements.txt was installed.
7. Enter: **pip list**
   1. This will display all the dependencies installed, you should see a fairly long list of programs.
8. Enter: **conda install -c conda-forge jupyterlab**
9. In your finder window, open PhAT-main, hold Option key and right click on FiberPho\_Main folder to copy the FiberPho\_Main pathname.

**Opening the PhAT GUI (Mac, Conda, Jupyter Lab)**

If this is your first time opening the GUI and you are continuing directly on from the previous section to opening the GUI, skep to step 3. If you have previously installed PhAT and are just starting a new GUI session, start from step 1.

1. Open a new terminal window.
2. Enter: **conda activate my\_gui\_env**
3. Enter: **cd /** **Users/castine/Desktop/PhAT-main/FiberPho\_Main**
   1. This will update the current directory to the FiberPho\_Main folder, where the Jupyter notebook ‘PhAT\_gui\_notebook.ipynb’ is located. This notebook will be used to launch the PhAT GUI.
4. Enter: **jupyter lab**
   1. This should launch a Jupyter Lab window. Going forward you will be working out of the Jupyter Lab window or the GUI instead of terminal, but do not close out of the terminal window or the GUI will close.
5. In the new Jupyter Lab window, select PhAT\_gui\_notebook.ipynb from the list of file names on the left side of the window (which should be pointing to the FiberPho\_Main folder since that was set as the current directory in terminal).
6. The PhAT GUI notebook is split into multiple cells containing blocks of code. The blocks are numbered [1], [2], etc. at the top left-hand side of each cell.
7. Starting with cell [1], execute each cell, making sure to let each cell finish executing before continuing to the next.
   1. When a cell is actively executing, it’s number will change to an \* ([1] 🡪 [\*]). When it is done running, this will change back to a number. Do not advance the code if the block number is [\*]. Another way to check is at the bottom of the window where it should say something like ‘Python 3 (ipykernel) | Idle.’ If a cell is actively executing, this will say Python 3 (ipykernel) | Busy’ or Python 3 (ipykernel) | Running.’ Do not run the next cell until this returns to ‘Idle.’
8. After executing each cell, a local URL will display in the corresponding cell output. Clicking this URL will open the GUI.
   1. *Example: Launching server at http://localhost:53698.*
9. See <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10054971/#S20> for details on using the GUI to import and analyze photometry data.
   1. For the “Create new fiber object” section, the fiber photometry data files will be those found in the PhAT\_stream\_csv data folder.
   2. For the “Import Behavior” section, the behavior data (time stamp) files will be the BORIS formatted files found in the PhAT\_stamp\_csv data folder.