

*Documentation for PSF Creation*

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# 1 PSF.py

The following python file utilizes the **ChaRT** form found on the following website:

<http://cxc.harvard.edu/ciao/PSFs/chart2/runchart.html>

Instead of filling in the form manually, we will allow python to do our bidding. Because of this, there are several python modules that must be installed: **selenium**, **chromium-chromedriver**<sup>1</sup>, **tarfile**, and **wget**. These can all be installed with the basic **pip install module\_name** command.

The program will calculate all necessary ChaRT parameters for you if you wish; otherwise you can enter the Effective Monochromatic Energy and Net Energy Flux when prompted by the command terminal. A prompt will be initiated upon running the python file which will ask if you want to calculate the chart parameters. If you do type **yes**, and if you dont type anything else!

Since the program requires data from you email server (It's set up for gmail only right now), you need to create a simple txt file containing the following two lines:

```
gmail_account = account_name
gmail_password = password
```

You will then feed the full path of this file into the python script. Since I share my code on GitHub, I find this to be the safest way to read in private information.

**Data:** Basic Reprocessd Data and ARF File for Region

**Result:** PSF file

Step 1: Prepare ChaRT Inputs ;

Step 2: Fill in ChaRT Form ;

Step 3: Wait until Email from ChaRT arrives and Read Zip Folder Web-Location ;

Step 4: Run **wget** to download the zip folder and then unzip ;

Step 5: Use **Marx** to calculate PSF for region ;

**Algorithm 1:** PSF Creation Algorithm

Once the file has been downloaded from ChaRT and unzipped, we must run the **Marx** program<sup>2</sup>. All necessary inputs for **Marx** are gathered insitu, thus requiring no user input.

Clearly, marx must be installed. This should be trivial since **ciao** is assumed to be installed. Run the following command from the terminal to install **Marx**:

```
install_marx
```

This only installs **Marx**, so we still need to initiate the program before we can run *PSF.py*. I suggest accessing your *.bashrc* profile (assuming you use *sh*) and adding an alias for **Marx**.

```
alias marx="source /full_path_to/setup_marx.sh"
```

After initially setting up **Marx** you will likely get an notification to do this step anyhow.

<sup>1</sup>Also need google chrome installed

<sup>2</sup><http://cxc.harvard.edu/ciao/threads/marx/>