SonyAutoAstro

Release 1.0

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Jan 19, 2023

CONTENTS:

Sony Auto astro is a powrful software for controle and use Sony camera in astronomy. It is developed for linux with python 3.

ONE

REQUIREMENT

- gphoto
- astrometry.net api key
- python 3
- rawpy ; keyring ; astroquery ; astropy ; numpy ; maplotlib

BEFORE USE

Because Sony Auto Astro is a wraper software, you need to install some other tools.

2.1 Gphoto

Gphoto is a powerfull linux softawre designed for control camera. This software is esential for SonyAutoAstro.

Install with :

```
sudo apt-get update
sudo apt-get install libusb-1.0-0-dev libtool libgphoto2-6 gphoto2
```

Now, on your camera, turn on the pc mode on usb mode.

You can check if the gphoto works with :

```
gphoto2 --list-ports
gphoto2 --auto-detect
gphoto2 --summary
```

2.2 Astrometry API key

You need to change the api key for astrometry in AutoAstro.py. This software is esential for SonyAutoAstro.

On a pyhton consol, run the folowing comand :

```python
import keyring
keyring.set_password('astroquery:astrometry_net', None, 'apikeyhere')
```

Change None to another name to assign usernames and use this usernames on AutoAstro.py line 16.

See here for more details : https://astroquery.readthedocs.io/en/latest/astrometry_net/astrometry_net.html#using-keyring-to-store-api-key

APPLICATION

- AutoAstro.py : Main software. make series of picture and saves in the curent directory.

- TrandfertTime.py : caracterise the time until gphoto save image in your folder.

- fits_write.py read and save r, g, b layer of a specific image.

3.1 AutoAstro

The software guide you for inisialise link whith camera. After that, propose to make some test for checking exposition parameter (adjustment to be made on the camera) and telescope position (with astrometry). Until it is done, software realise a series of pictures.

3.1.1 Check before run

Before run the software, check the Before use part.

Check also you are in the right folder for write your picture and you have free space on your disk.

Your camera need to be in raw captur and in the usb mode pc control.

3.1.2 Init

At the beginging, the software tel you to set the usb port used for gphoto. The information is avail on the sumary on the controle.

3.1.3 Test part

The first part of the software is the test part. The software captur a picture and downlad it and tel you if you want to make an astrometry or re-do a captur. The file are save under the name test{}.arw

If you want to change the exposure of your image, you must make the settings directly on the camera.

If you maeke an astrometry, the result is available on https://nova.astrometry.net/dashboard/submissions . The softawre also display the ra,dec coordof your image and the ngc object in your fov (fond by a simbad query).

When all is good, you can go to the main loop.

3.1.4 Loop part

In this part, you need to define the nomber of picture and their name.

3.2 TransfertTime

Thsi litle script captur 15 picture and estimate the time your computer nee to make the captur transfert. For good aproximation, take your camera on the fastest speed available. All test image are delated at the end.

3.3 FitsWrite

This programme read a picture and save each rgb layer on a single fits file.

FOUR

FUTURE IMPROVEMENT

- Adding graphic interface
- Control Celestron Nexstar telescope (realignment every x images)
- Check collimation
- Check focus