SonyAutoAstro

Release 1.1

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

This software have been tested with sony a5000 and sony a6600.

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 AA.cfg. This software is esential for SonyAutoAstro.

On a python consol, run the folowing comand :

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

Change None to another name to assign usernames and use this usernames on AA.cfg under user in Astrometry caategorie.

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 AA.cfg config file

This config file is useful for improve productivity an automatisation of your setup. If you don't know witch value used, leave the default values so that the software asks you.

The config file is define as folow :

gphoto :

- port = the usb port used by the camera

astrometry :

- user = the user name define with keyring for astrometry tools (see Astrometry API key part for more information)

sky_object :

- name = name of the objects you observe

- nbrpict = nomber of pictures you want to take

3.1.3 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.

3.1.4 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.

3.1.5 Loop part

This part is the main loop. The software take the number of photo you want.

You need to define the nomber of picture and their name if not define in AA.cfg.

Check sometime if your object is allaws in the frame.

3.2 TransfertTime

This little script capture 15 picture and estimates how long your computer needs to transfer the capture. For good approximation, take your camera on the fastest speed available. All test images are deleted 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