Picamera2

To See More Information About the Picamera2 Library

https://datasheets.raspberrypi.com/camera/picamera2-manual.pdf

Installing Picamera2 Software

1. Open a terminal and update the installed software.

```
sudo apt update
sudo apt upgrade -y
```

2. Install the Picamera2 Python3 module. For the latest Raspberry Pi OS releases (September 2022 onwards) it comes pre-installed, but this command will also update your version to the latest release.

```
sudo apt install -y python3-picamera2
```

Taking a Photograph with Picamera2 (take_picture.py)

```
from picamera2 import Picamera2
import time
camera = Picamera2()
camera.resolution = (1280, 720)
time.sleep(2)

camera.start_and_capture_file(file_name)
print("Done.")
```

Taking a Photos Every 10 Seconds with Picamera2 (take_picture_every_ten_seconds.py)

```
import os
from picamera2 import Picamera2, Preview
import time
FOLDER_NAME="/home/pi/camera_activity"
if not os.path.exists(FOLDER_NAME):
   os.mkdir(FOLDER_NAME)
camera = Picamera2()
camera.start_preview(Preview.NULL)
camera.resolution = (1280, 720)
camera.rotation=180
time.sleep(2)
counter =1
while True:
   file_name = FOLDER_NAME + "/img" + str(counter) +".jpg"
   counter += 1
   camera.start_and_capture_file(file_name)
   time.sleep(10)
print("Done.")
```

Setting Overlays(camera_overlays.py)

Run following code from terminal:

```
python3
from picamera2 import Picamera2

#numpy is a Python library used for working with arrays

import numpy as np

picam2 = Picamera2()
picam2.configure(picam2.create_preview_configuration())

#Opens Preview window.

picam2.start(show_preview=True)

#Sets up the array and assigns a different overaly to each quadrant
```

```
overlay = np.zeros((300, 400, 4), dtype=np.uint8)
overlay[:150, 200:] = (255, 0, 0, 64) # reddish
overlay[150:, :200] = (0, 255, 0, 64) # greenish
overlay[150:, 200:] = (0, 0, 255, 64) # blueish

picam2.set_overlay(overlay)
```

Rotating Image (camera_flip.py)

```
# Run the camera with a 180 degree rotation.

import time
import libcamera
from picamera2 import Picamera2
picam2 = Picamera2()
picam2.start_preview(show_preview=True)
preview_config = picam2.create_preview_configuration()
preview_config["transform"] = libcamera.Transform(hflip=1, vflip=1)
picam2.stop()
picam2.configure(preview_config)
picam2.start()
picam2.capture_file("/home/pi/Desktop/bench_flip.jpg")
picam2.stop_preview()
time.sleep(2)
```

Take Video With Picamera2 - h264 Format (take_video.py)

```
from picamera2 import Picamera2
from picamera2.encoders import Quality
picam2 = Picamera2()
video_config = picam2.create_video_configuration(main={"size":(1280,720)})
picam2.start_and_record_video("/home/pi/Desktop/test.h264",quality=Quality.HIGH,c
onfig=video_config, duration=5, show_preview=True,audio=False)
```

Take Video With Picamera2 - h264 Format (take_video2.py)

```
from picamera2.encoders import H264Encoder
from picamera2 import Picamera2
import time
camera = Picamera2()
video_config = camera.create_video_configuration()
camera.configure(video_config)
```

```
encoder = H264Encoder(bitrate=10000000)
output = "/home/pi/Desktop/video.h264"
camera.start_recording(encoder, output)
time.sleep(10)
camera.stop_recording()
print("Done.")
```

Take Video With Picamera2 -mp4 Format(take_video_mp4.py)

```
from picamera2 import Picamera2
picam2 = Picamera2()
video_config = picam2.create_video_configuration(main={"size":(960,540)})
picam2.configure(video_config)
picam2.start_and_record_video("/home/pi/Desktop/test_video.mp4", duration=5)
```

Convert h264 Files to mp4 Using

#Don't think it's necessary to use since Picamera2 allows you to create m64 Files

```
sudo apt-get install gpac

MP4Box -add home/pi/Desktop/test.h264 home/pi/Desktop/test.mp4
```

Splitting Video Files To Smaller mp4 Files - (split_video.py)

Picamera2 does not have this functionality. I wrote the following script that does the same thing.

```
from picamera2 import Picamera2
picam2 = Picamera2()
video_config = picam2.create_video_configuration(main={"size":(960,540)})
picam2.configure(video_config)
startfilename = "video"
ctr = 0
# Loop to create new videos every 5 seconds
while True:
   ctr=ctr+1
   filename= startfilename + str(ctr)
   picam2.start_and_record_video("/home/pi/Desktop/" + filename + ".mp4",
   duration=5)
```