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Class :- TE - A

Roll No :- 42

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Assignments No :- 5

Aim :-

Understanding and Connectivity of Raspberry - Pi / Beagle board with camera. Write an application to capture and store the image.

Theory :-

Raspberry Pi Camera module the Raspberry Pi Camera Module V2 replaced the Original Camera Module in April 2016. The V2 camera Module has a Sony IMX-219 8-megapixel sensor. The Camera Module can be used to take high-definition video, as well as stills photographs. It's easy to use for beginners, but has plenty to offer advanced users if you're looking to expand your knowledge. We can also use the libraries we bundle with the camera to create effects. We can read all the gory details about IMX219 & the Exmore R back-illuminated sensor architecture on Sony's website, but suffice to say this is more than just an incremental upgrade: it's a leap forward in image quality, colour fidelity, & low-light performance.

It supports 1080p 30, 720p60 & VGA90 video modes, as well as still capture. It attaches via a 5cm ribbon cable to the CSI port on the Raspberry Pi. The camera works with all models of Raspberry Pi 1, 2, and 3. It can be accessed through the MMAL & V4L APIs, & there are numerous third-party libraries built for it, including the Pi camera python library. The camera module is very popular in home security applications & in wildlife camera traps.

** Open Raspberry Pi Configuration and Enable the Camera.

Raspberry Pi Configuration - <input type="checkbox"/> <input type="checkbox"/>	
System	Interfaces
Camera :	<input checked="" type="radio"/> Enabled <input type="radio"/> Disabled
SSH :	<input checked="" type="radio"/> Enabled <input type="radio"/> Disabled
VNC :	<input type="radio"/> Enabled <input checked="" type="radio"/> Disabled
SPI :	<input type="radio"/> Enabled <input checked="" type="radio"/> Disabled
I2C :	<input type="radio"/> Enabled <input checked="" type="radio"/> Disabled
Serial :	<input type="radio"/> Enabled <input checked="" type="radio"/> Disabled
1-Wire :	<input type="radio"/> Enabled <input checked="" type="radio"/> Disabled
Remote GPIO :	<input type="radio"/> Enabled <input checked="" type="radio"/> Disabled
<input type="button" value="Cancel"/> <input type="button" value="OK"/>	

Camera Preview :-

```
from picamera import PiCamera
from time import sleep
camera = PiCamera()
camera.start_preview()
sleep(10)
camera.stop_preview()
```

Rotating the Camera

```
camera.rotation = 180
camera.start_preview()
sleep(10)
camera.stop_preview()
```

Storing the image

```
from picamera import PiCamera
from time import sleep
camera = PiCamera()
camera.start_preview()
sleep(10)
camera.capture('/home/pi/Desktop/image1.jpg')
camera.stop_preview()
```

Recording the video

```
from pi camera import Pi Camera
```



```
from time import sleep
camera = PiCamera()
camera.start_preview()
camera.start_recording('home/pi/
video-h264')
sleep(10)
camera.stop_recording()
camera.stop_preview()
```

Converting and Playing Video

The video format need to get converted to MP4. So install gpac.

Sudo apt-get install gpac.

Now convert the video to MP4.

MP4Box -fgs30 -addvideo-h264
video.mp4.

Conclusion :-

Thus, we have studied Pi camera & also stored the images & videos using Pi camera.