CS 1010

Getting started with Raspberry Pi and PiCamera

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```
import cv2
Import picamera
```

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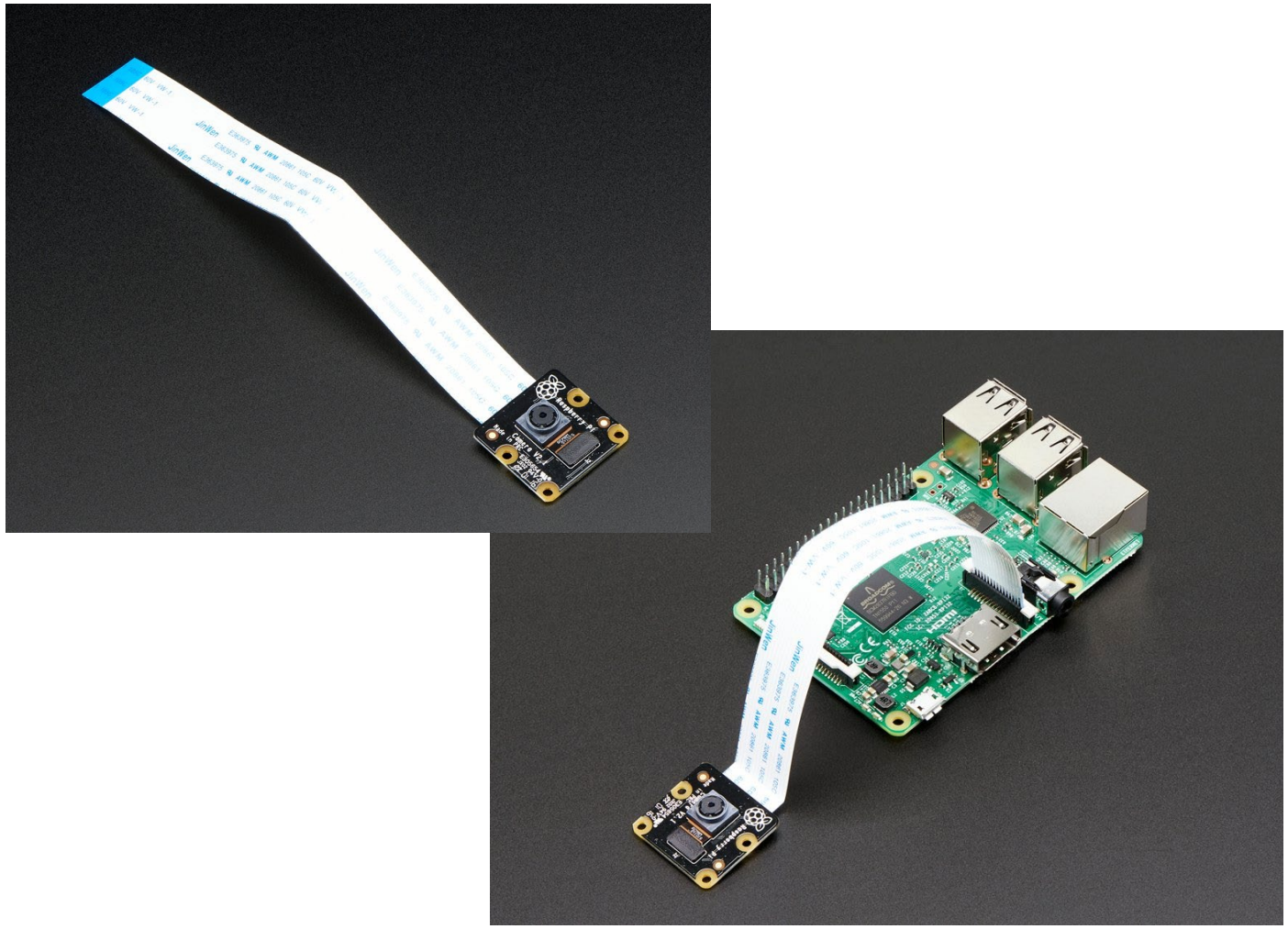
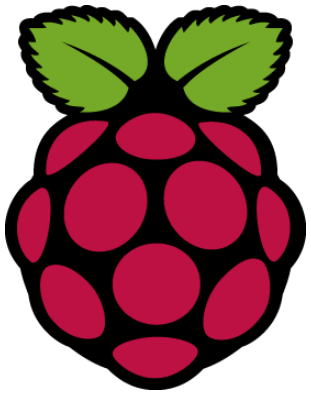
Photo: Kartik Bulusu

Introducing the Pi NoIR Camera

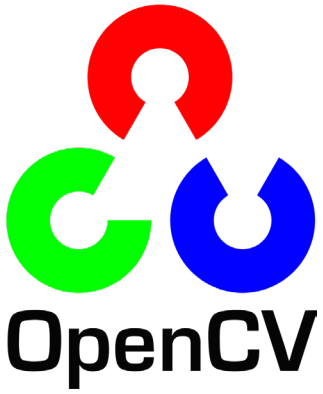


- 8 megapixel native resolution high quality Sony IMX219 image sensor
- 3280 x 2464 pixel static images
- Capture video at
  - 1920 x 1080 p30
  - 1280 x 720 p60
  - 640 x 480 p90 resolutions
- No Infrared (NoIR) filter
  - Infrared photographs or photographing objects in low light (twilight) conditions

Source:
https://www.adafruit.com/product/3100#description



picamera 1.13



Raspberry Pi hardware and Camera hardware interactions
Low-level image acquisition and processing

Computer vision on the Raspberry Pi

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picamera 1.13

OpenCV

```
# import the necessary packages

from picamera.array import PiRGBArray
from picamera import PiCamera
import time
import cv2
```

picamera 1.13

```
# initialize the camera and grab a reference
# to the raw camera capture

camera = PiCamera()
camera.resolution = (320, 240)
rawCapture = PiRGBArray(camera)
```

```
# allow the camera to warmup
time.sleep(0.1)
```

picamera 1.13

```
# grab an image from the camera
camera.capture(rawCapture, format="bgr")
image = rawCapture.array
```

OpenCV

```
# display the image on screen and wait for a keypress
cv2.imshow("Image", image)
cv2.imwrite("savedImage.png", image)
cv2.waitKey(0)
```

Goal of the lab segment

Co-work

- Observe, ask and try in groups

Make

- Build-a-hack
- Use Pi NoIR Camera to acquire an images
- import OpenCV library

Perform basic image processing functions using OpenCV