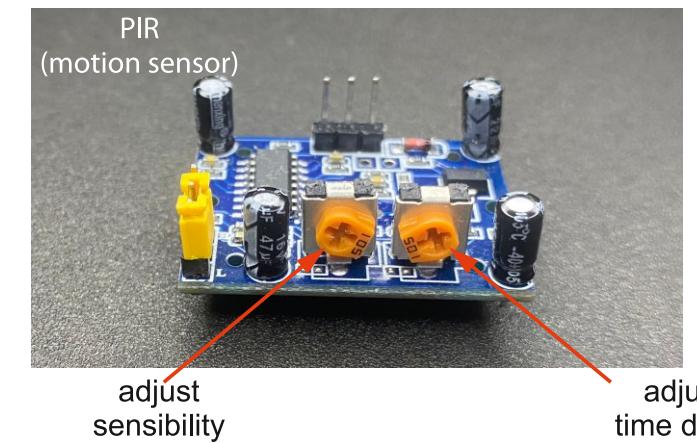
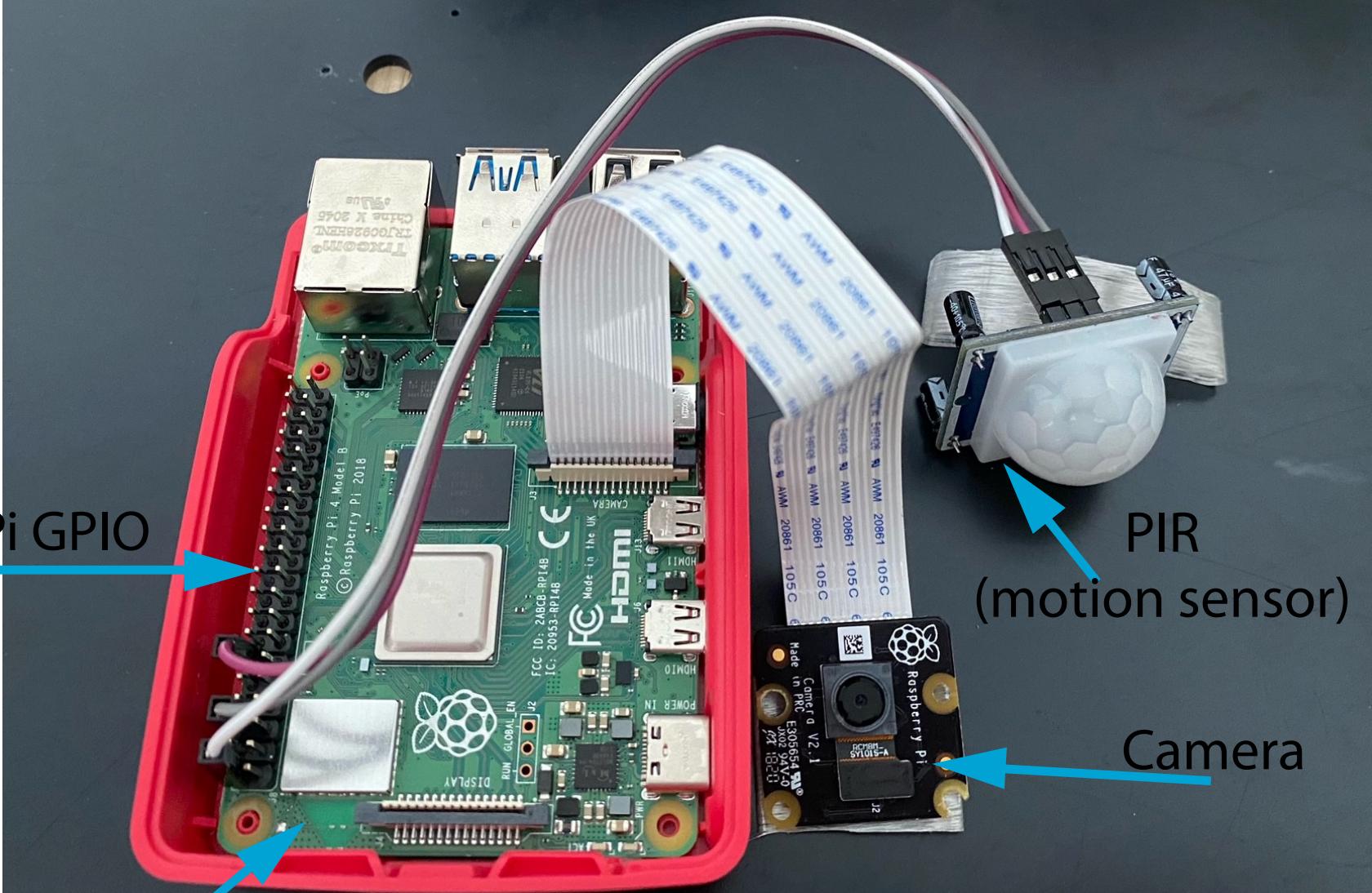
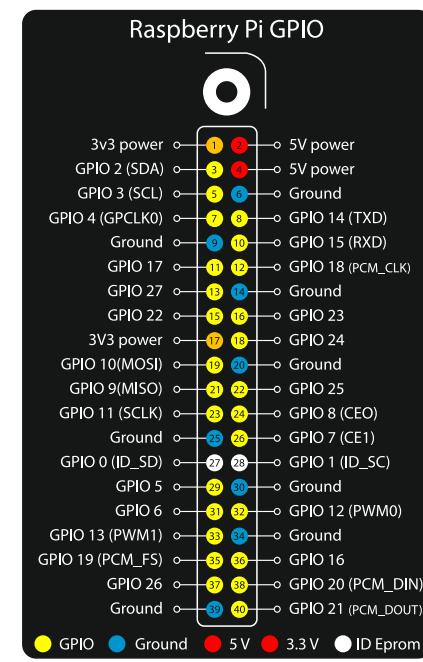




PROJECT UKDER1 Rekognition IoT part



This is IOT part of our AWS Project (more about project on:
https://github.com/lemonade-666/AWS_UKDER1_Rekognition)

Raspberry Pi with PIR sensor and camera set up instructions

Required hardware:

Raspberry Pi with loaded operational system on SD card (we are using Rasbian)

Camera (our camera is the Raspberry Pi NoIR Camera v2

(NoIR = No Infrared This means that pictures you take by daylight will look decidedly curious, but it gives you the ability to see in the dark with infrared lighting.

PIR sensor (motion detector) offers a tentative range of detection of about 6–7 meters and is highly sensitive.

When the PIR motion sensor detects a person, it outputs a 5V signal to the Raspberry Pi through its GPIO and we define what the Raspberry Pi should do as it detects an intruder through the Python coding in our case will display message 'Motion detected' and will trigger camera

Required installation steps:

1 INSTALL PYTHON ON RASPBERRY PI - NECESSARY TO RUN OUR CODE

sudo apt install python3

2 INSTALL PIP3

sudo apt-get install python3-pip

3 INSTALL AWSCLI

sudo pip3 install --upgrade awscli

4 INSTALL BOTO3

sudo pip install boto3

BEFORE USING BOTO3, YOU NEED TO SET UP AUTHENTICATION CREDENTIALS FOR YOUR AWS ACCOUNT USING EITHER THE IAM CONSOLE OR THE AWS CLI

5 CONFIGURE AWS CONNECTION

aws configure

(We need to enter our unique:)

AWS Access Key ID ...

Secret Access Key ...

Default region ...

Default output format ...



PYTHON CODE FOR TAKING PICTURES USING RASPBERRY PI, CAMERA AND MOTION SENSOR THIS CODE USE SIMPLE WHILE TRUE LOOP

```

from gpiozero import MotionSensor
import time
from picamera import PiCamera
import boto3
import datetime
camera = PiCamera()
pir = MotionSensor(18)                                ///our motion control is connected to GPIO no 18
camera.resolution = (1280, 720)                         ///this is our picture resolution - it may be bigger or smaller depends on requirements
camera.annotate_text = "Hello AWS UKDER-1 Team!"        /// we can add annotate text to the picture

while True:                                            ///while true loop
  pir.wait_for_motion()
  print("Motion Detected. Smile. Taking Picture")
  camera.capture('/home/pi/boto3/image1.jpg')
  print("Sending Picture to andrzejtestbucket")
  bucket_name = 'andrzejtestbucket'
  content = open('image1.jpg', 'rb')
  s3 = boto3.client('s3')
  s3.put_object(
    Bucket=bucket_name,
    Key = datetime.datetime.now().strftime ("%Y-%m-%d-%H.%M.%S.jpg"),
    Body=content
  )
  time.sleep(2)

```

When we run our code the device will wait for a signal from the motion sensor.

If there is a movement detected then the motion sensor will trigger the camera, and the camera will take a picture and save the picture on our device.

Then our code uses boto3 to take this picture and save it into our s3 bucket (the picture in s3 bucket will be saved as date and exact time).

TEST

I have mounted the device next to the entrance door and the device has been connected to the power. I am expecting delivery from Amazon.

I have connected to my Raspberry Pi device using SSH connection (putty) and run the UKDER1 python program

Device was waited for movement (courier with my package)

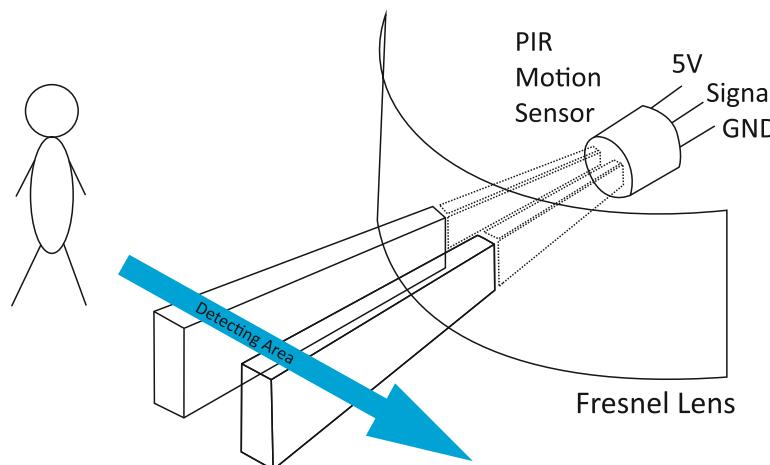
When the courier arrives with my package - the device has been triggered by the courier move, and started taking pictures and sending them to s3 bucket.

I have logged in to my s3 bucket to check if there are any pictures.

Yes all ok.

Test Complete

Now The AI team can process the images.



How the PIR (Passive Infra Red) Motion Sensor works

Summary

IoT devices with connection with AWS can have endless possibilities; we can connect loads of different sensors, cameras, machines.

It can be used to monitor or execute everything, everywhere. The future will be fascinated, automated and more predictable

on the Next stage we will connect this device with **Amazon IoT Core** and add some more sensors and devices to our Raspberry Pi to make our device more advanced like:

Electromagnetic lock and NFC (Near Field Communication) is a wireless technology allowing contactless point-to-point data communication between devices within a short distance of 10 cm With this tools we can build devices that will be able to take pictures, recognise a person face and if allowed then our device will open the door.



PROJECT
UKDER1
Rekognition
IoT part



PROJECT UKDER1

Rekognition IoT part





PROJECT
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Our IoT Device
Waiting for delivery courier



Python Code

```
pi@raspberrypi:~/boto3
GNU nano 3.2

from gpiozero import MotionSensor
import time
from picamera import PiCamera
import boto3
import datetime

camera = PiCamera()
pir = MotionSensor(18)

camera.resolution = (1280, 720)
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while True:
    pir.wait_for_motion()
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    s3.put_object(
        Bucket=bucket_name,
        Key = datetime.datetime.now().strftime ("%Y-%m-%d-%H.%M.%S.jpg"),
        Body=content
    )
    time.sleep(2)
```

Login thru SSH to Raspberry Pi and run the code

```
pi@raspberrypi:~/boto3
login as: pi
pi@192.168.0.62's password:
Linux raspberrypi 5.10.17-v7l+ #1414 SMP Fri Apr 30 13:20:47 BST 2021 armv7l

The programs included with the Debian GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*copyright.

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
Last login: Sun Jun 27 16:15:40 2021 from 192.168.0.46
pi@raspberrypi:~ $ cd boto3
pi@raspberrypi:~/boto3 $ python3 ukder1.py
AWS libcrypto resolve: searching process and loaded modules
AWS libcrypto resolve: found static aws-lc HMAC symbols
AWS libcrypto resolve: found static aws-lc libcrypto 1.1.1 EVP_MD symbols
```

UKDER1 program has started sending pictures to s3

```
pi@raspberrypi:~/boto3
login as: pi
pi@192.168.0.62's password:
Linux raspberrypi 5.10.17-v7l+ #1414 SMP Fri Apr 30 13:20:47 BST 2021 armv7l

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Motion Detected. Smile. Taking Picture
Sending Picture to andrzejtestbucket
Motion Detected. Smile. Taking Picture
Sending Picture to andrzejtestbucket
Motion Detected. Smile. Taking Picture
Sending Picture to andrzejtestbucket
```

Pictures in S3 Bucket

Amazon S3 > andrzejtestbucket

andrzejtestbucket

Objects

Properties

Permissions

Metrics

Management

Access Points

Objects (5)

Objects are the fundamental entities stored in Amazon S3. You can use [Amazon S3 inventory](#) to get a list of all objects in your bucket. For others to access your objects, you'll need to explicitly grant them permissions. [Learn more](#)

< 1 >

<input type="checkbox"/>	Name	Type	Last modified	Size	Storage class
<input type="checkbox"/>	2021-06-27-16.36.28.jpg	jpg	June 27, 2021, 16:36:29 (UTC+01:00)	550.9 KB	Standard
<input type="checkbox"/>	2021-06-27-16.36.31.jpg	jpg	June 27, 2021, 16:36:32 (UTC+01:00)	546.5 KB	Standard
<input type="checkbox"/>	2021-06-27-16.36.35.jpg	jpg	June 27, 2021, 16:36:36 (UTC+01:00)	542.1 KB	Standard
<input type="checkbox"/>	2021-06-27-16.36.45.jpg	jpg	June 27, 2021, 16:36:46 (UTC+01:00)	546.6 KB	Standard
<input type="checkbox"/>	2021-06-27-16.36.48.jpg	jpg	June 27, 2021, 16:36:49 (UTC+01:00)	553.0 KB	Standard



aws
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