

# Raspberry Pi Security Camera Report

## User & Installation Guide

### Introduction

The goal of this project was to make a Security Camera that could warn you by message. For this, we are using Anaconda, a laptop and a webcam. But it is easily transposable to a raspberry Pi with a Camera module.

The software is programmed in python.

Here what it does:

1. Capture the video feed
2. Compare images to see if something moved
3. Send an alert if test is positive

This document is both user & installation guide, for developer mainly. it's not meant to be use be a real customer for now.

In this document you will see how to setup the environment, and how to run the program.

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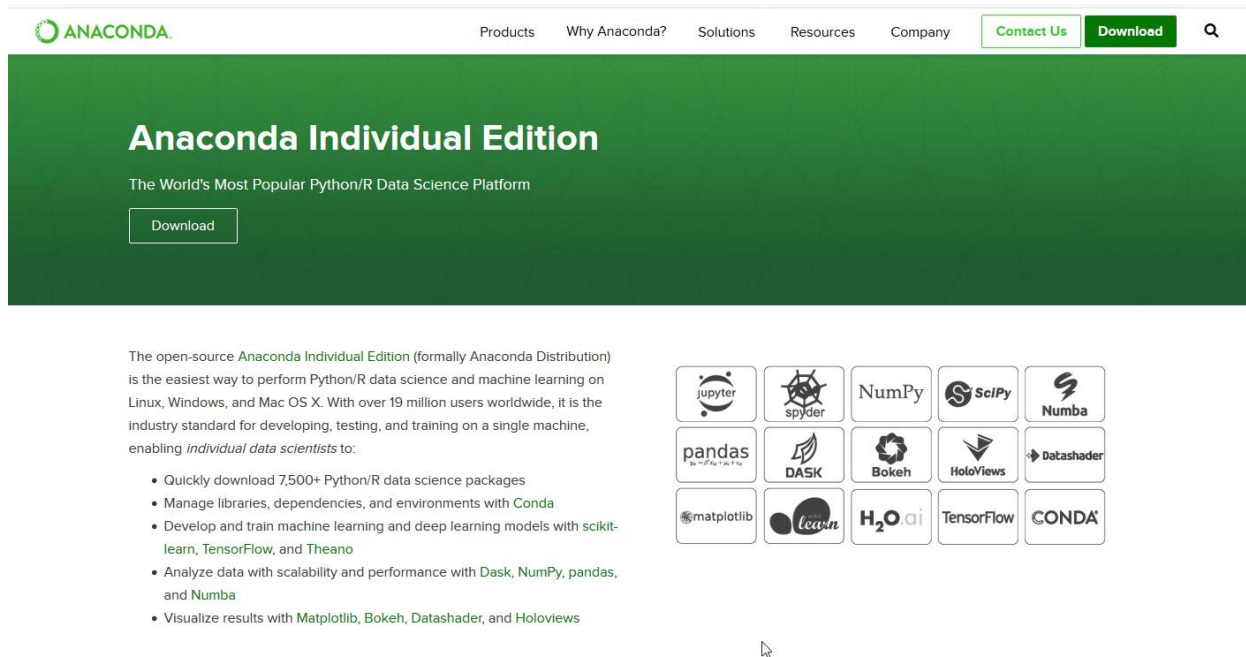
## Setup the Environment

### Install Anaconda

While the raspberry is not available, let's use Anaconda.

It is an open source python environment for Linux/Windows/MacOS.

<https://www.anaconda.com/distribution/>



The open-source **Anaconda Individual Edition** (formerly Anaconda Distribution) is the easiest way to perform Python/R data science and machine learning on Linux, Windows, and Mac OS X. With over 19 million users worldwide, it is the industry standard for developing, testing, and training on a single machine, enabling *individual data scientists* to:

- Quickly download 7,500+ Python/R data science packages
- Manage libraries, dependencies, and environments with Conda
- Develop and train machine learning and deep learning models with scikit-learn, TensorFlow, and Theano
- Analyze data with scalability and performance with Dask, NumPy, pandas, and Numba
- Visualize results with Matplotlib, Bokeh, Dask, and HoloViews

The grid of logos includes: Jupyter, Spyder, NumPy, SciPy, Numba, pandas, DASK, Bokeh, HoloViews, Dask, Matplotlib, scikit-learn, H2O.ai, TensorFlow, and CONDA.

## Install libraries

### 1. Packages used

Here are the packages that were used for the project.

*OpenCV (package: cv2)*

It is a library that is mostly used for visual computing and machine learning.

It handles the acquisition of images, or video feed, and their manipulation/transformation.

<https://opencv-python-tutroals.readthedocs.io/>

*Scikit-image (package: skimage)*

This [is a collection of algorithms for image processing and analysis](#).

<https://scikit-image.org/>

*Twilio (package: twilio)*

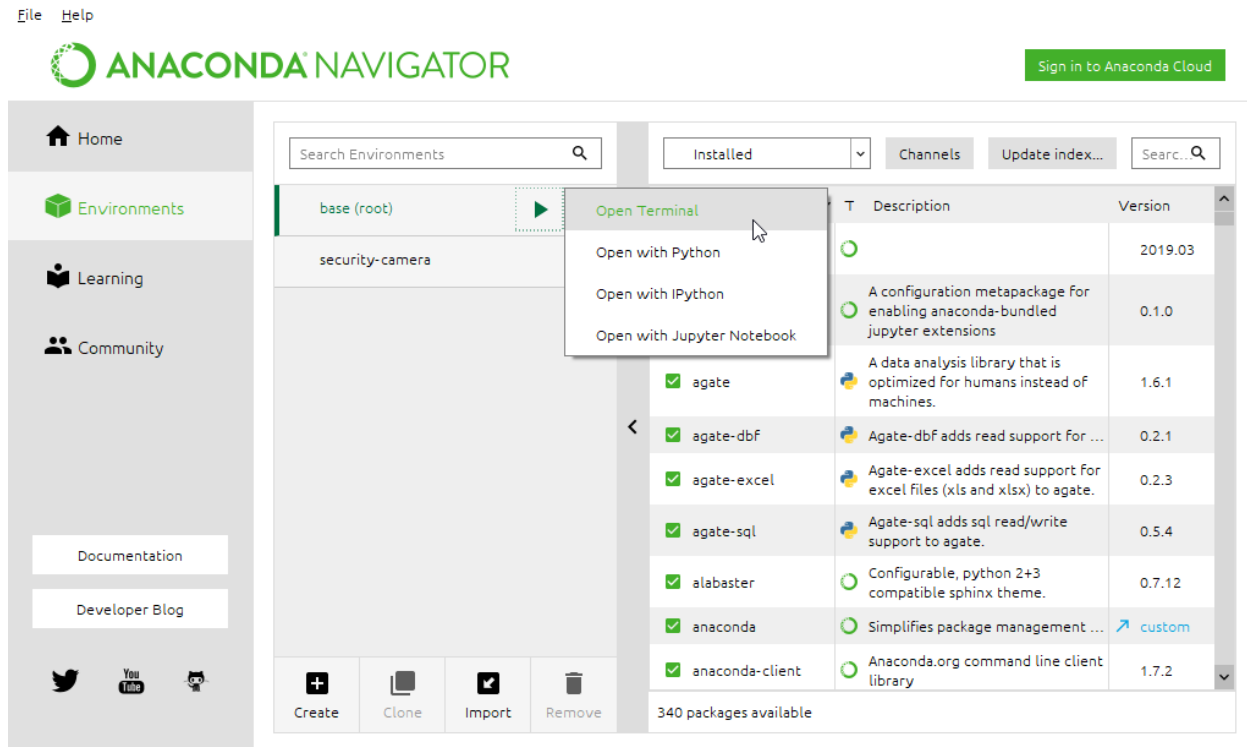
This is a platform that provide multiple communication services, such as messaging for marketing or authentication.

<https://www.twilio.com/>

## 2. Install packages

Launch Anaconda, select Environment in the left menu.

Then open terminal:



And install the missing packages, executing these commands :

```
conda install -c conda-forge opencv
conda install -c conda-forge twilio
conda install -c conda-forge scikit-image
```

## Getting the project from repository

Open a terminal and type

Git clone <https://vm0758.kaj.pouta.csc.fi/git/raspberrypi-security-camera>

```
PS D:\Users\Valou\Desktop> git clone https://vm0758.kaj.pouta.csc.fi/git/raspberrypi-security-camera
Cloning into 'raspberrypi-security-camera'...
remote: Counting objects: 5, done.
remote: Compressing objects: 100% (5/5), done.
remote: Total 5 (delta 0), reused 0 (delta 0)
Unpacking objects: 100% (5/5), 36.77 KiB | 1.02 MiB/s, done.
PS D:\Users\Valou\Desktop>
```

A new folder should be available where you executed the terminal.

Hei, look, there's an env file :

```
1  # -*- coding: utf-8 -*-
2  """
3  Created on Thu Feb 13 09:59:30 2020
4
5  CREDENTIALS
6  Contain TWILIO API info and number to alert
7
8  @author: Valentin
9  """
10
11  #Twilio credentials
12  TWILIO_ACCOUNT_SID = 'example'
13  TWILIO_AUTH_TOKEN = 'example'
14  TWILIO_PHONE = '+0 123 456 789'
15
16  #The phone you want to text
17  PHONE_NUMBER = '+11 1 11 11 11 11'
```

These variables are used to send an alert by SMS.

We will get the info we need in the next part.

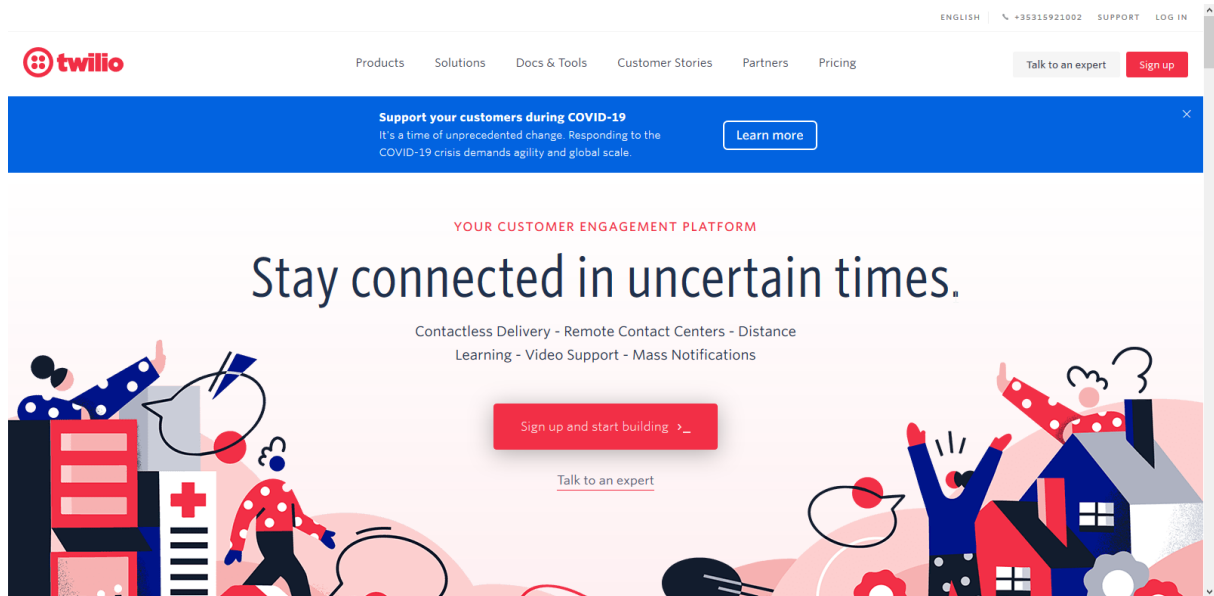
## Get your Twilio credentials

1. Create an account or login

We need to get Twilio API keys and credentials to allow us to send SMS.

Sign up here :

<https://www.twilio.com/>



## 2. Get credentials

Now login and get your credentials from your dashboard.

<https://www.twilio.com/console>

You'll need :

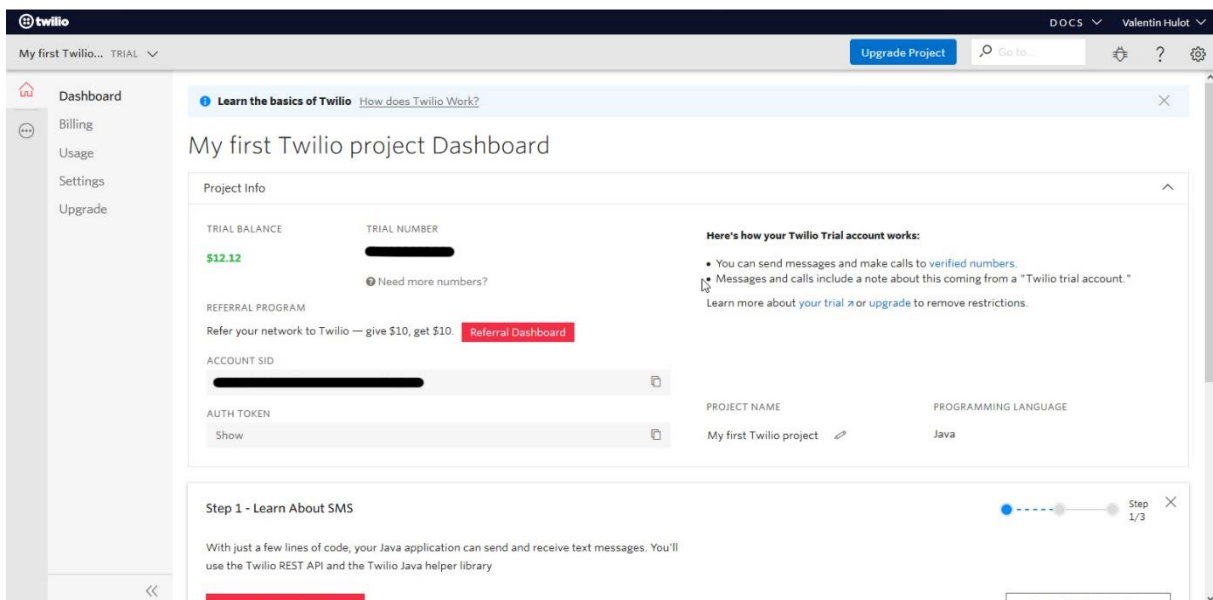
- Trial number
- Account SID
- Auth Token

## 3. Add destination numbers

To avoid spamming of people that didn't ask anything, we can only text verified numbers.

Let's add your number and the number of your team mates if you want.

<https://www.twilio.com/console/phone-numbers/verified>



## 4. Fill .env file

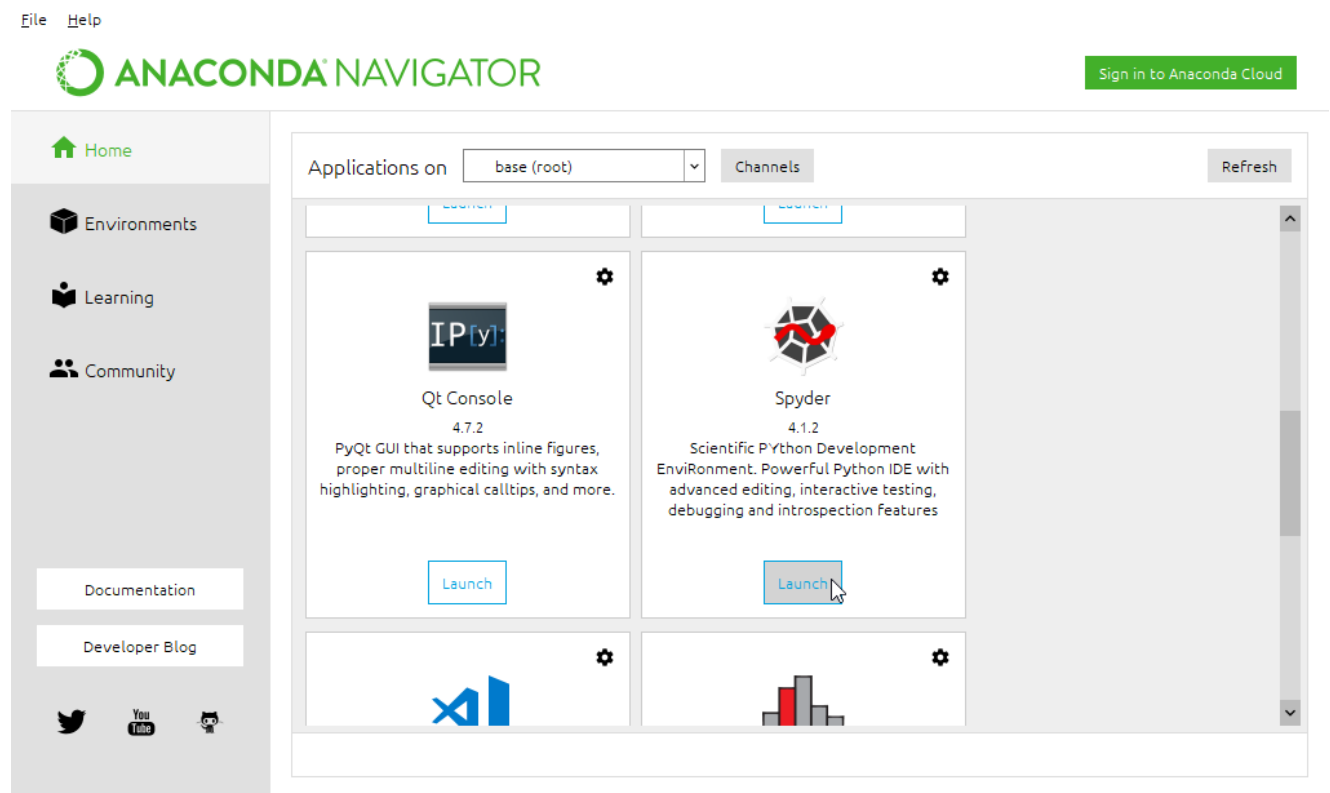
Now that you have all the info that you need, you can fill the .env file and proceed to next part.



## Executing program

### Launch Spyder

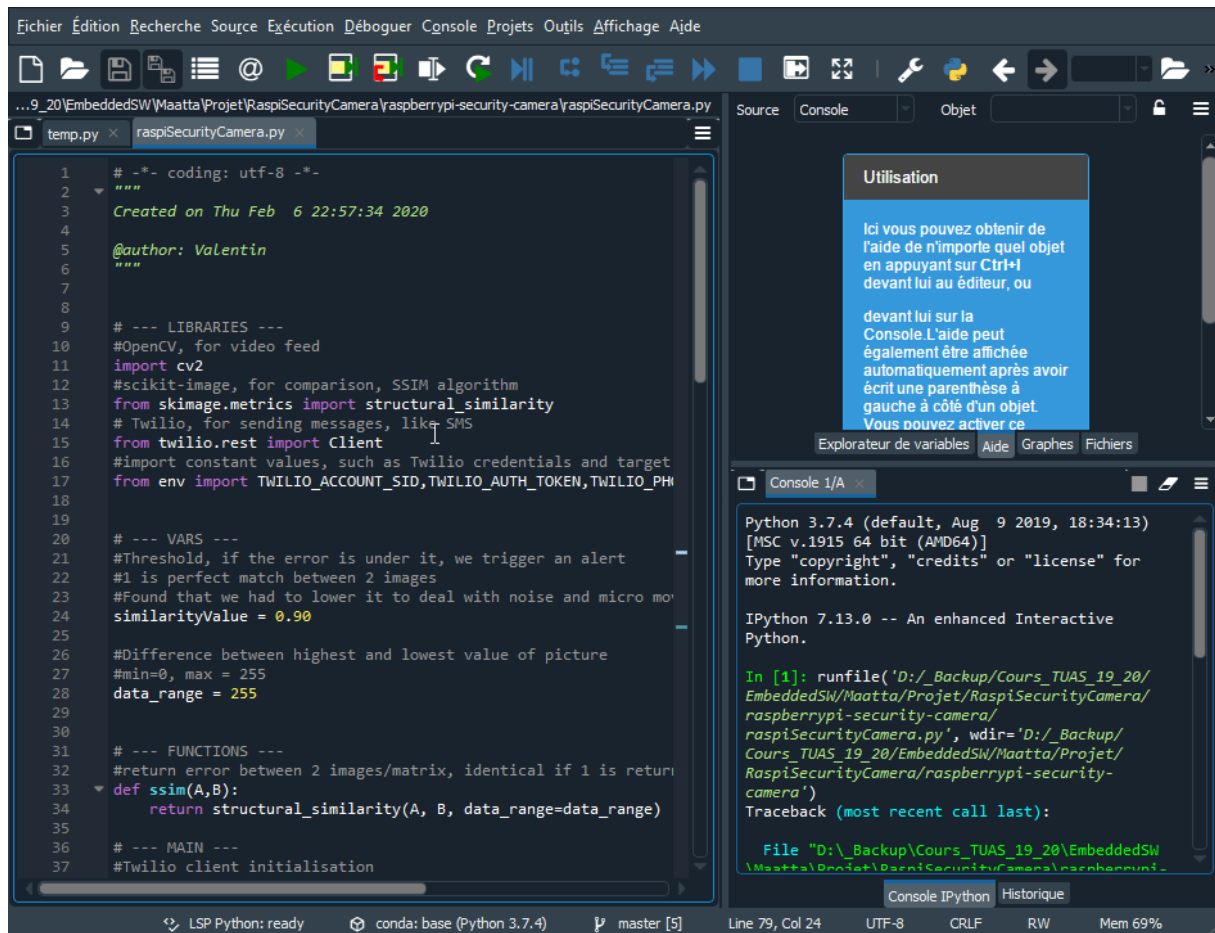
You can use Spyder to run the program, you can launch it from Anaconda Home page.




## Open .py file and execute

When Spyder is launched, open .py file with File > open...

And select the raspiSecurityCamera.py file.



You can then execute it with “execute” button .

A video demo video is available on Redmine, the name is “demo\_raspiSecuCamera.mp4” .