

# Detector-de-Mascarilla

August 8, 2022

```
[1]: get_ipython().system('pip install opencv-python')
get_ipython().system('pip install matplotlib')
get_ipython().system('pip install tensorflow==2.9.1')
get_ipython().system('pip install pillow')
```

```
Requirement already satisfied: opencv-python in d:\entorno aislado, librerias de
python\env\lib\site-packages (4.6.0.66)
Requirement already satisfied: numpy>=1.21.2 in d:\entorno aislado, librerias de
python\env\lib\site-packages (from opencv-python) (1.23.1)
Requirement already satisfied: matplotlib in d:\entorno aislado, librerias de
python\env\lib\site-packages (3.5.2)
Requirement already satisfied: cycler>=0.10 in d:\entorno aislado, librerias de
python\env\lib\site-packages (from matplotlib) (0.11.0)
Requirement already satisfied: pyparsing>=2.2.1 in d:\entorno aislado, librerias
de python\env\lib\site-packages (from matplotlib) (3.0.9)
Requirement already satisfied: python-dateutil>=2.7 in d:\entorno aislado,
librerias de python\env\lib\site-packages (from matplotlib) (2.8.2)
Requirement already satisfied: kiwisolver>=1.0.1 in d:\entorno aislado,
librerias de python\env\lib\site-packages (from matplotlib) (1.4.4)
Requirement already satisfied: pillow>=6.2.0 in d:\entorno aislado, librerias de
python\env\lib\site-packages (from matplotlib) (9.2.0)
Requirement already satisfied: fonttools>=4.22.0 in d:\entorno aislado,
librerias de python\env\lib\site-packages (from matplotlib) (4.34.4)
Requirement already satisfied: packaging>=20.0 in d:\entorno aislado, librerias
de python\env\lib\site-packages (from matplotlib) (21.3)
Requirement already satisfied: numpy>=1.17 in d:\entorno aislado, librerias de
python\env\lib\site-packages (from matplotlib) (1.23.1)
Requirement already satisfied: six>=1.5 in d:\entorno aislado, librerias de
python\env\lib\site-packages (from python-dateutil>=2.7->matplotlib) (1.16.0)
Requirement already satisfied: tensorflow==2.9.1 in d:\entorno aislado,
librerias de python\env\lib\site-packages (2.9.1)
Requirement already satisfied: gast<=0.4.0,>=0.2.1 in d:\entorno aislado,
librerias de python\env\lib\site-packages (from tensorflow==2.9.1) (0.4.0)
Requirement already satisfied: grpcio<2.0,>=1.24.3 in d:\entorno aislado,
librerias de python\env\lib\site-packages (from tensorflow==2.9.1) (1.47.0)
Requirement already satisfied: protobuf<3.20,>=3.9.2 in d:\entorno aislado,
librerias de python\env\lib\site-packages (from tensorflow==2.9.1) (3.19.4)
Requirement already satisfied: termcolor>=1.1.0 in d:\entorno aislado, librerias
```

```
de python\env\lib\site-packages (from tensorflow==2.9.1) (1.1.0)
Requirement already satisfied: keras-preprocessing>=1.1.1 in d:\entorno aislado,
librerias de python\env\lib\site-packages (from tensorflow==2.9.1) (1.1.2)
Requirement already satisfied: h5py>=2.9.0 in d:\entorno aislado, librerias de
python\env\lib\site-packages (from tensorflow==2.9.1) (3.7.0)
Requirement already satisfied: six>=1.12.0 in d:\entorno aislado, librerias de
python\env\lib\site-packages (from tensorflow==2.9.1) (1.16.0)
Requirement already satisfied: packaging in d:\entorno aislado, librerias de
python\env\lib\site-packages (from tensorflow==2.9.1) (21.3)
Requirement already satisfied: tensorflow-io-gcs-filesystem>=0.23.1 in
d:\entorno aislado, librerias de python\env\lib\site-packages (from
tensorflow==2.9.1) (0.26.0)
Requirement already satisfied: libclang>=13.0.0 in d:\entorno aislado, librerias
de python\env\lib\site-packages (from tensorflow==2.9.1) (14.0.6)
Requirement already satisfied: flatbuffers<2,>=1.12 in d:\entorno aislado,
librerias de python\env\lib\site-packages (from tensorflow==2.9.1) (1.12)
Requirement already satisfied: typing-extensions>=3.6.6 in d:\entorno aislado,
librerias de python\env\lib\site-packages (from tensorflow==2.9.1) (4.3.0)
Requirement already satisfied: astunparse>=1.6.0 in d:\entorno aislado,
librerias de python\env\lib\site-packages (from tensorflow==2.9.1) (1.6.3)
Requirement already satisfied: numpy>=1.20 in d:\entorno aislado, librerias de
python\env\lib\site-packages (from tensorflow==2.9.1) (1.23.1)
Requirement already satisfied: wrapt>=1.11.0 in d:\entorno aislado, librerias de
python\env\lib\site-packages (from tensorflow==2.9.1) (1.14.1)
Requirement already satisfied: google-pasta>=0.1.1 in d:\entorno aislado,
librerias de python\env\lib\site-packages (from tensorflow==2.9.1) (0.2.0)
Requirement already satisfied: tensorboard<2.10,>=2.9 in d:\entorno aislado,
librerias de python\env\lib\site-packages (from tensorflow==2.9.1) (2.9.1)
Requirement already satisfied: setuptools in d:\entorno aislado, librerias de
python\env\lib\site-packages (from tensorflow==2.9.1) (63.4.1)
Requirement already satisfied: tensorflow-estimator<2.10.0,>=2.9.0rc0 in
d:\entorno aislado, librerias de python\env\lib\site-packages (from
tensorflow==2.9.1) (2.9.0)
Requirement already satisfied: absl-py>=1.0.0 in d:\entorno aislado, librerias
de python\env\lib\site-packages (from tensorflow==2.9.1) (1.2.0)
Requirement already satisfied: opt-einsum>=2.3.2 in d:\entorno aislado,
librerias de python\env\lib\site-packages (from tensorflow==2.9.1) (3.3.0)
Requirement already satisfied: keras<2.10.0,>=2.9.0rc0 in d:\entorno aislado,
librerias de python\env\lib\site-packages (from tensorflow==2.9.1) (2.9.0)
Requirement already satisfied: wheel<1.0,>=0.23.0 in d:\entorno aislado,
librerias de python\env\lib\site-packages (from
astunparse>=1.6.0->tensorflow==2.9.1) (0.37.1)
Requirement already satisfied: werkzeug>=1.0.1 in d:\entorno aislado, librerias
de python\env\lib\site-packages (from tensorboard<2.10,>=2.9->tensorflow==2.9.1)
(2.2.1)
Requirement already satisfied: requests<3,>=2.21.0 in d:\entorno aislado,
librerias de python\env\lib\site-packages (from
tensorboard<2.10,>=2.9->tensorflow==2.9.1) (2.28.1)
```

Requirement already satisfied: tensorboard-data-server<0.7.0,>=0.6.0 in d:\entorno aislado, librerias de python\env\lib\site-packages (from tensorboard<2.10,>=2.9->tensorflow==2.9.1) (0.6.1)

Requirement already satisfied: markdown>=2.6.8 in d:\entorno aislado, librerias de python\env\lib\site-packages (from tensorboard<2.10,>=2.9->tensorflow==2.9.1) (3.4.1)

Requirement already satisfied: tensorboard-plugin-wit>=1.6.0 in d:\entorno aislado, librerias de python\env\lib\site-packages (from tensorboard<2.10,>=2.9->tensorflow==2.9.1) (1.8.1)

Requirement already satisfied: google-auth-oauthlib<0.5,>=0.4.1 in d:\entorno aislado, librerias de python\env\lib\site-packages (from tensorboard<2.10,>=2.9->tensorflow==2.9.1) (0.4.6)

Requirement already satisfied: google-auth<3,>=1.6.3 in d:\entorno aislado, librerias de python\env\lib\site-packages (from tensorboard<2.10,>=2.9->tensorflow==2.9.1) (2.10.0)

Requirement already satisfied: pyparsing!=3.0.5,>=2.0.2 in d:\entorno aislado, librerias de python\env\lib\site-packages (from packaging->tensorflow==2.9.1) (3.0.9)

Requirement already satisfied: cachetools<6.0,>=2.0.0 in d:\entorno aislado, librerias de python\env\lib\site-packages (from google-auth<3,>=1.6.3->tensorboard<2.10,>=2.9->tensorflow==2.9.1) (5.2.0)

Requirement already satisfied: rsa<5,>=3.1.4 in d:\entorno aislado, librerias de python\env\lib\site-packages (from google-auth<3,>=1.6.3->tensorboard<2.10,>=2.9->tensorflow==2.9.1) (4.9)

Requirement already satisfied: pyasn1-modules>=0.2.1 in d:\entorno aislado, librerias de python\env\lib\site-packages (from google-auth<3,>=1.6.3->tensorboard<2.10,>=2.9->tensorflow==2.9.1) (0.2.8)

Requirement already satisfied: requests-oauthlib>=0.7.0 in d:\entorno aislado, librerias de python\env\lib\site-packages (from google-auth-oauthlib<0.5,>=0.4.1->tensorboard<2.10,>=2.9->tensorflow==2.9.1) (1.3.1)

Requirement already satisfied: charset-normalizer<3,>=2 in d:\entorno aislado, librerias de python\env\lib\site-packages (from requests<3,>=2.21.0->tensorboard<2.10,>=2.9->tensorflow==2.9.1) (2.1.0)

Requirement already satisfied: urllib3<1.27,>=1.21.1 in d:\entorno aislado, librerias de python\env\lib\site-packages (from requests<3,>=2.21.0->tensorboard<2.10,>=2.9->tensorflow==2.9.1) (1.26.11)

Requirement already satisfied: certifi>=2017.4.17 in d:\entorno aislado, librerias de python\env\lib\site-packages (from requests<3,>=2.21.0->tensorboard<2.10,>=2.9->tensorflow==2.9.1) (2022.6.15)

Requirement already satisfied: idna<4,>=2.5 in d:\entorno aislado, librerias de python\env\lib\site-packages (from requests<3,>=2.21.0->tensorboard<2.10,>=2.9->tensorflow==2.9.1) (3.3)

Requirement already satisfied: MarkupSafe>=2.1.1 in d:\entorno aislado, librerias de python\env\lib\site-packages (from werkzeug>=1.0.1->tensorboard<2.10,>=2.9->tensorflow==2.9.1) (2.1.1)

Requirement already satisfied: pyasn1<0.5.0,>=0.4.6 in d:\entorno aislado, librerias de python\env\lib\site-packages (from pyasn1-modules>=0.2.1->google-auth<3,>=1.6.3->tensorboard<2.10,>=2.9->tensorflow==2.9.1) (0.4.8)

```
Requirement already satisfied: oauthlib>=3.0.0 in d:\entorno aislado, librerias  
de python\env\lib\site-packages (from requests-oauthlib>=0.7.0->google-auth-  
oauthlib<0.5,>=0.4.1->tensorboard<2.10,>=2.9->tensorflow==2.9.1) (3.2.0)  
Requirement already satisfied: pillow in d:\entorno aislado, librerias de  
python\env\lib\site-packages (9.2.0)
```

```
[2]: import os  
import tensorflow as tf  
import numpy as np  
import cv2  
import matplotlib.pyplot as plt
```

```
[3]: print(tf.__version__)
```

```
2.9.1
```

```
[4]: direc_entrenamiento='D:\Entorno Aislado, Librerias de  
Python\env\observations-master\experiements\data'  
direc_entre_mask=os.path.join(direc_entrenamiento,"with_mask")  
direc_entre_No_mask=os.path.join(direc_entrenamiento,"without_mask")
```

```
[5]: print('total imagenes con mascarillas', len(os.listdir(direc_entre_mask)))  
print('total imagenes sin mascarillas', len(os.listdir(direc_entre_No_mask)))
```

```
total imagenes con mascarillas 690  
total imagenes sin mascarillas 686
```

```
[ ]:
```

```
[6]: model=tf.keras.models.Sequential([  
    tf.keras.layers.Conv2D(16, (3,3), activation='relu',  
    input_shape=(150,150,3)),  
    tf.keras.layers.MaxPooling2D(2,2),  
    tf.keras.layers.Conv2D(32, (3,3),activation='relu'),  
    tf.keras.layers.MaxPooling2D(2,2),  
    tf.keras.layers.Conv2D(64, (3,3),activation='relu'),  
    tf.keras.layers.MaxPooling2D(2,2),  
    tf.keras.layers.Flatten(),  
    tf.keras.layers.Dense(512,activation='relu'),  
    #Clasificacion binaria  
    tf.keras.layers.Dense(1,activation= 'sigmoid')  
])
```

```
[7]: from tensorflow.keras.optimizers import Adam  
model.compile(optimizer=Adam(lr=0.001),  
              loss='binary_crossentropy',  
              metrics=['accuracy'])
```

```
D:\Entorno Aislado, Librerias de Python\env\lib\site-packages\keras\optimizers\optimizer_v2\adam.py:110: UserWarning: The `lr` argument is deprecated, use `learning_rate` instead.  
    super(Adam, self).__init__(name, **kwargs)
```

```
[8]: from tensorflow.keras.preprocessing.image import ImageDataGenerator  
img_height =150  
img_width=150  
batch_size=10  
train_datagen=ImageDataGenerator(rescale=1./255,  
                                  shear_range=0.2,  
                                  zoom_range=0.2,  
                                  horizontal_flip=True,  
                                  validation_split=0.2) #set validation split  
  
train_generator =train_datagen.flow_from_directory(  
direc_entrenamiento,  
target_size=(img_height,img_width),  
batch_size=batch_size,  
class_mode='binary',  
subset='training') #set as training data  
  
validation_generator = train_datagen.flow_from_directory(  
direc_entrenamiento, #same directory as a training data  
target_size=(img_height,img_width),  
batch_size=batch_size,  
class_mode='binary',  
subset='validation' #data set para al validacion  
)
```

Found 1101 images belonging to 2 classes.

Found 275 images belonging to 2 classes.

```
[9]: nb_epochs =10  
history =model.fit_generator(  
    train_generator,  
    steps_per_epoch = train_generator.samples // batch_size,  
    validation_data = validation_generator,  
    validation_steps=validation_generator.samples // batch_size,  
    epochs = nb_epochs)
```

```
C:\Users\Jean Inga Montes\AppData\Local\Temp\ipykernel_18992\2129418451.py:2:  
UserWarning: `Model.fit_generator` is deprecated and will be removed in a future  
version. Please use `Model.fit`, which supports generators.
```

```
    history =model.fit_generator(  
  
Epoch 1/10  
110/110 [=====] - 24s 211ms/step - loss: 0.3591 -  
accuracy: 0.8506 - val_loss: 0.1567 - val_accuracy: 0.9481
```

```

Epoch 2/10
110/110 [=====] - 16s 148ms/step - loss: 0.0825 -
accuracy: 0.9743 - val_loss: 0.0905 - val_accuracy: 0.9741
Epoch 3/10
110/110 [=====] - 15s 140ms/step - loss: 0.0661 -
accuracy: 0.9725 - val_loss: 0.1376 - val_accuracy: 0.9593
Epoch 4/10
110/110 [=====] - 15s 140ms/step - loss: 0.0729 -
accuracy: 0.9808 - val_loss: 0.0864 - val_accuracy: 0.9815
Epoch 5/10
110/110 [=====] - 16s 144ms/step - loss: 0.1584 -
accuracy: 0.9496 - val_loss: 0.0969 - val_accuracy: 0.9704
Epoch 6/10
110/110 [=====] - 16s 144ms/step - loss: 0.2631 -
accuracy: 0.8726 - val_loss: 0.1881 - val_accuracy: 0.9333
Epoch 7/10
110/110 [=====] - 16s 141ms/step - loss: 0.1532 -
accuracy: 0.9413 - val_loss: 0.1360 - val_accuracy: 0.9519
Epoch 8/10
110/110 [=====] - 15s 140ms/step - loss: 0.0949 -
accuracy: 0.9661 - val_loss: 0.1833 - val_accuracy: 0.9370
Epoch 9/10
110/110 [=====] - 17s 150ms/step - loss: 0.1052 -
accuracy: 0.9716 - val_loss: 0.1054 - val_accuracy: 0.9667
Epoch 10/10
110/110 [=====] - 16s 143ms/step - loss: 0.0757 -
accuracy: 0.9762 - val_loss: 0.0920 - val_accuracy: 0.9741

```

```
[10]: import matplotlib.pyplot as plt
acc = history.history['accuracy']
loss =history.history['loss']

#Graficar la exactitud vs las perdidas
epochs =range(len(acc))

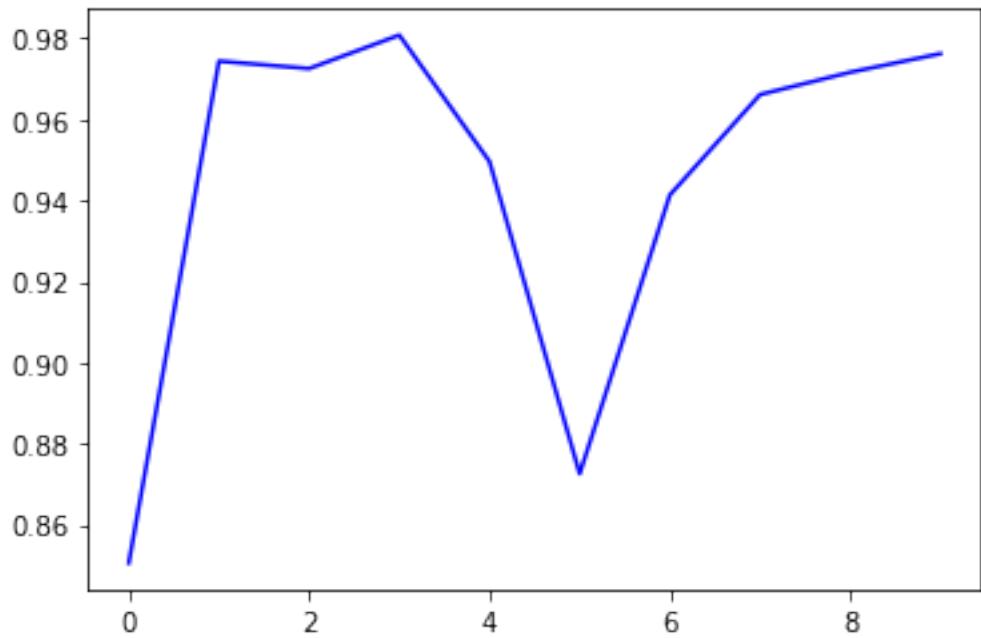
#envio de datos a graficar
plt.plot(epochs, acc, 'b', label='Exactitud del entrenamiento comunitarias')
plt.title('Exactitud del entrenamiento- P comunitarias')

plt.figure()

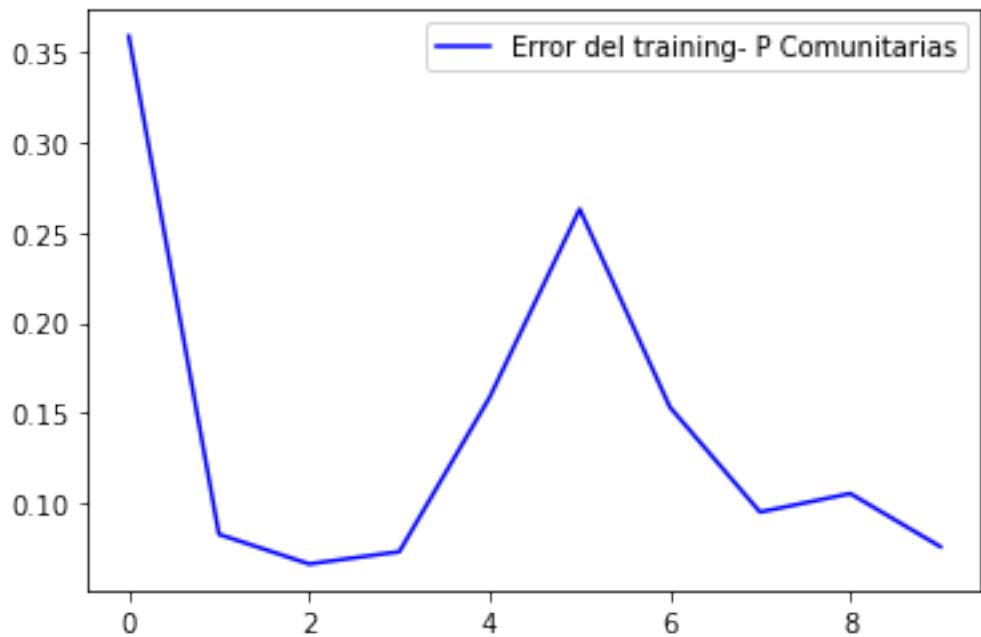
plt.plot(epochs, loss, 'b', label ='Error del training- P Comunitarias')
plt.title('Error de entrenamiento - P comunitarias')
plt.legend()

plt.show()
```

Exactitud del entrenamiento- P comunitarias



Error de entrenamiento - P comunitarias



```
[11]: import matplotlib.pyplot as plt
from tensorflow.keras.preprocessing import image
from PIL import Image

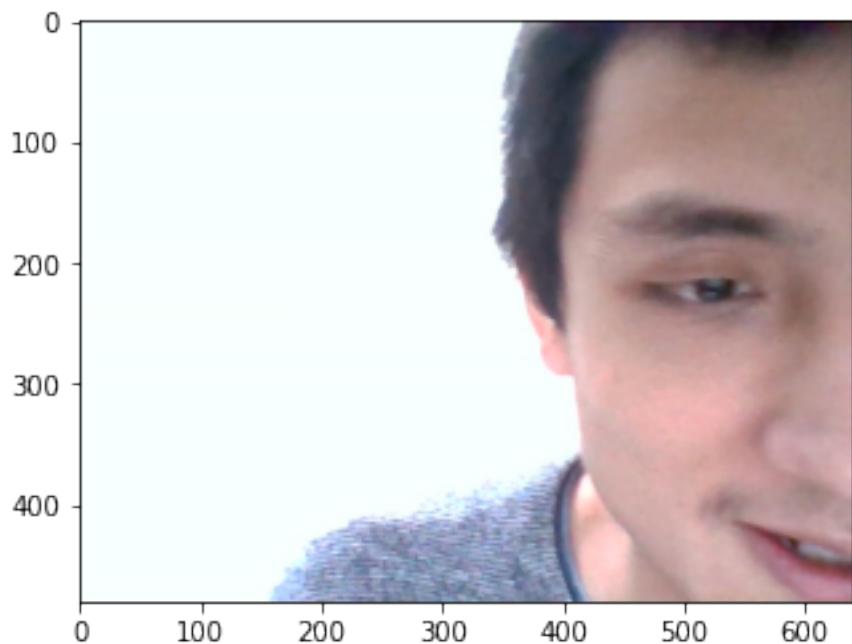
[12]: vc = cv2.VideoCapture(0)

plt.ion()
if vc.isOpened():
    is_capturing, frame = vc.read()
    frame = cv2.cvtColor(frame, cv2.COLOR_BGR2RGB)
    webcam_preview = plt.imshow(frame)
else:
    is_capturing = False

while is_capturing:
    try:
        is_capturing, frame = vc.read()
        frame = cv2.cvtColor(frame, cv2.COLOR_BGR2RGB)
        frame_res = cv2.resize(frame, dsize=(150, 150), interpolation=cv2.
        ↪INTER_CUBIC) #Lee el mismo size que espera el modelo y te ahorra reshapes
        x=image.img_to_array(frame_res)
        x=np.expand_dims(x, axis=0)
        images = np.vstack([x])
        classes = model.predict(images, batch_size=10)
        if classes[0]>0:
            print("No lleva Mascarilla - P. Comunitarias")
        else:
            print("Si lleva Macarilla - P.Comunitarias")
        webcam_preview = plt.imshow(frame)

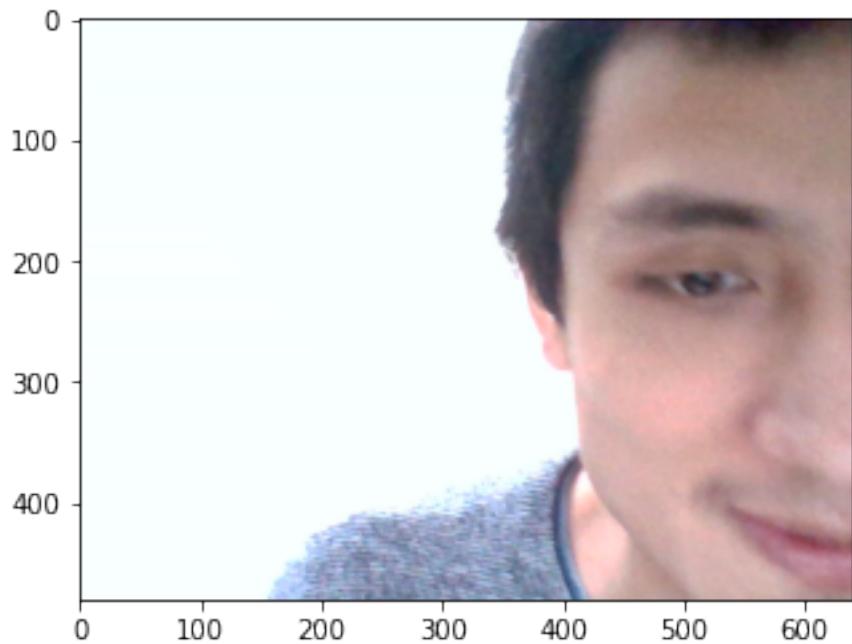
        webcam_preview.set_data(frame)
        plt.draw()
        try:
            plt.pause(0.05)
        except Exception:
            pass
    except KeyboardInterrupt:
        vc.release()
```

1/1 [=====] - 0s 95ms/step  
 Si lleva Macarilla - P.Comunitarias



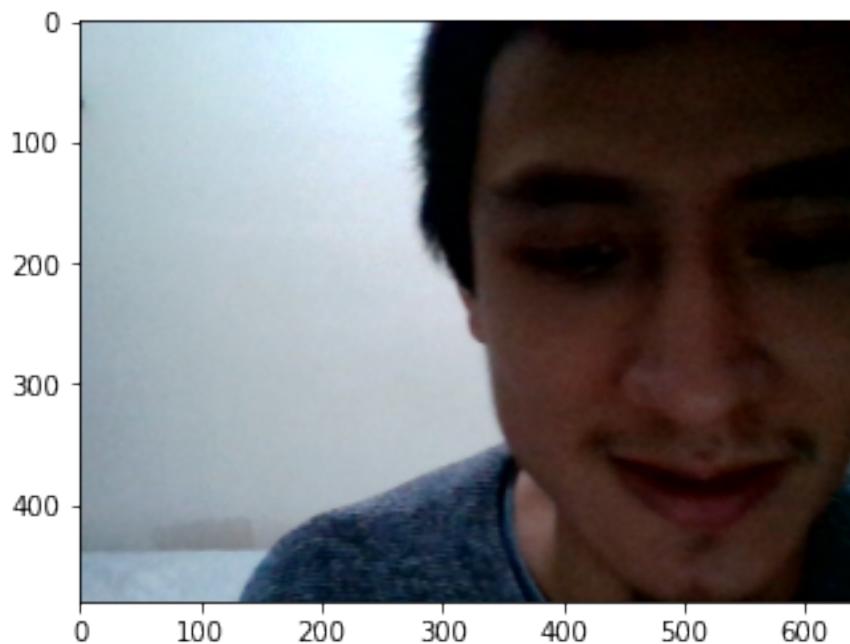
1/1 [=====] - 0s 20ms/step

Si lleva Macarilla - P.Comunitarias



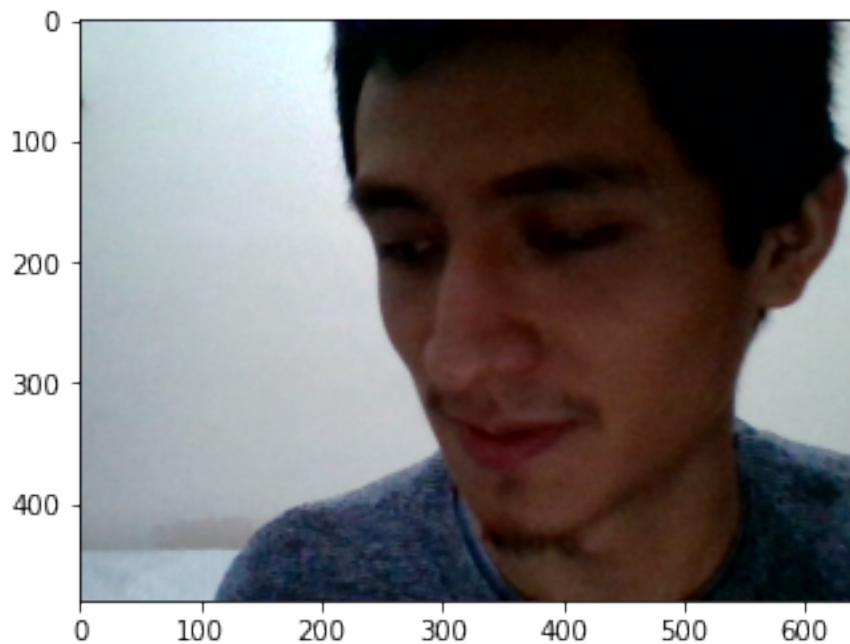
1/1 [=====] - 0s 21ms/step

Si lleva Macarilla - P.Comunitarias

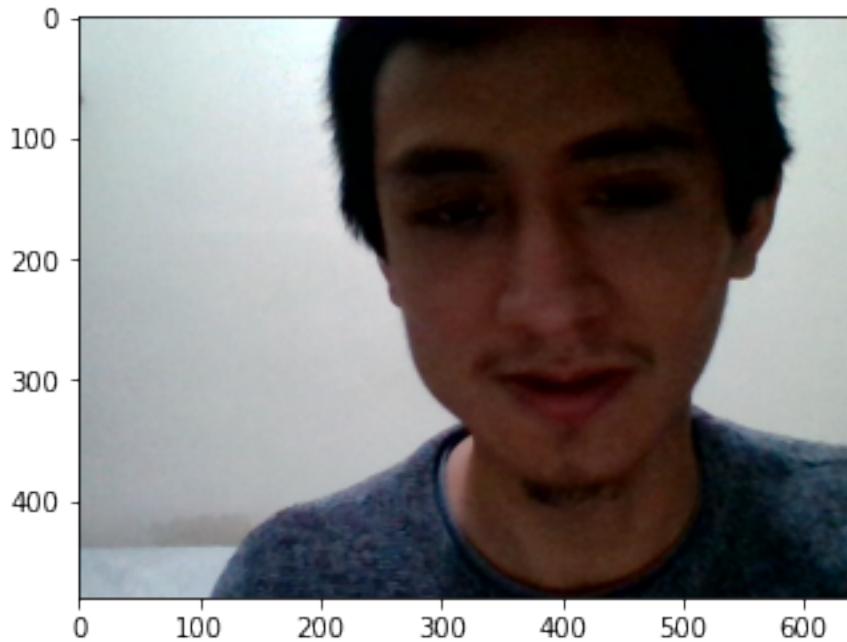


1/1 [=====] - 0s 21ms/step

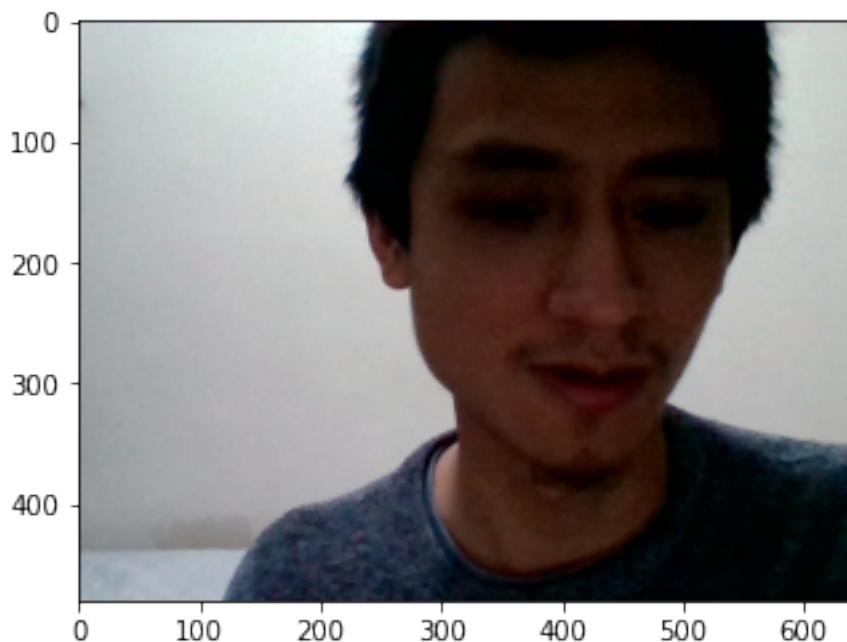
No lleva Mascarilla - P. Comunitarias



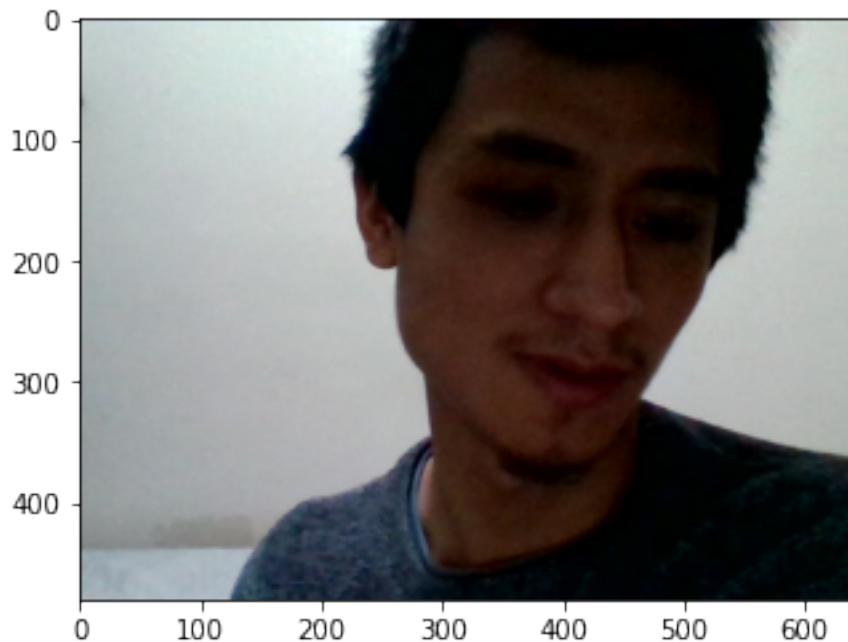
1/1 [=====] - 0s 30ms/step  
No lleva Mascarilla - P. Comunitarias



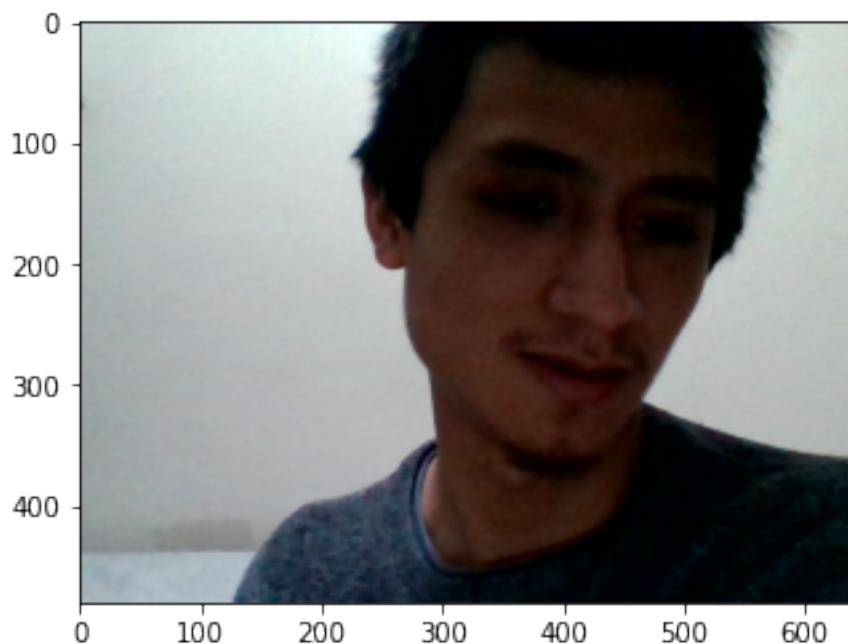
1/1 [=====] - 0s 20ms/step  
No lleva Mascarilla - P. Comunitarias



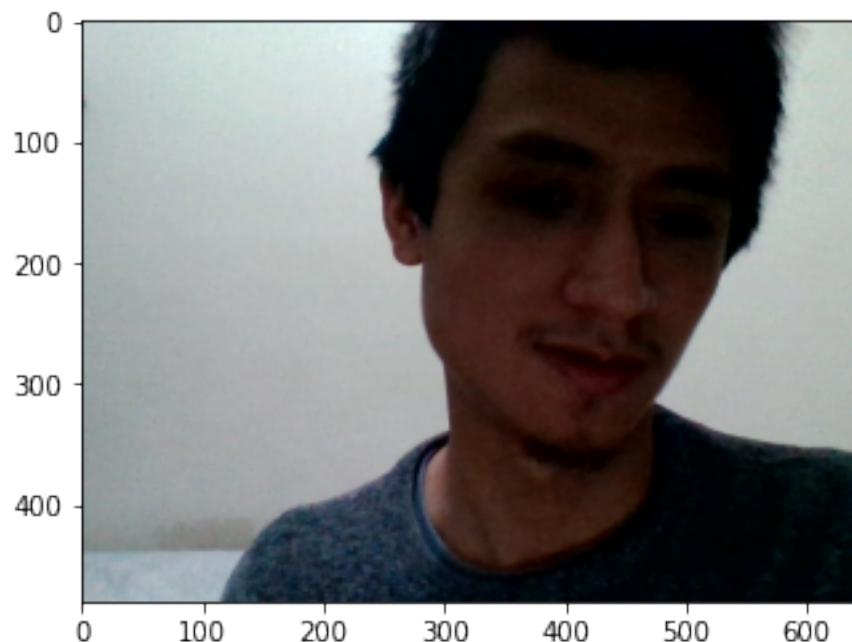
1/1 [=====] - 0s 21ms/step  
No lleva Mascarilla - P. Comunitarias



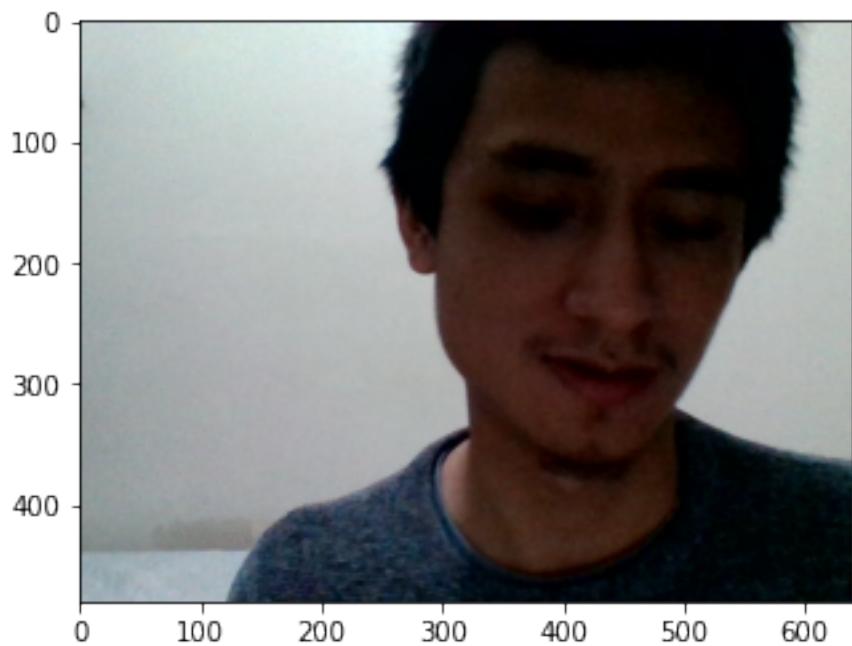
1/1 [=====] - 0s 20ms/step  
No lleva Mascarilla - P. Comunitarias



1/1 [=====] - 0s 22ms/step  
No lleva Mascarilla - P. Comunitarias

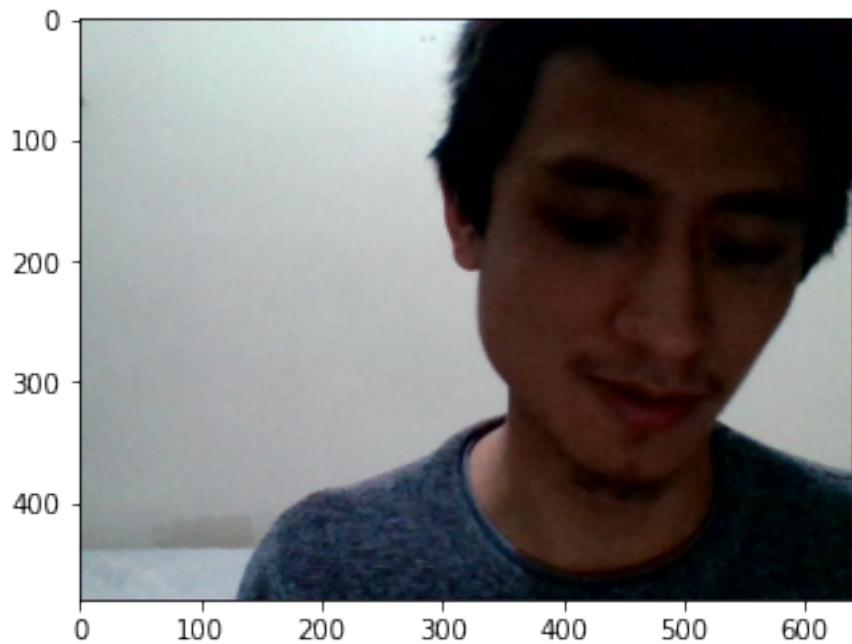


1/1 [=====] - 0s 20ms/step  
No lleva Mascarilla - P. Comunitarias



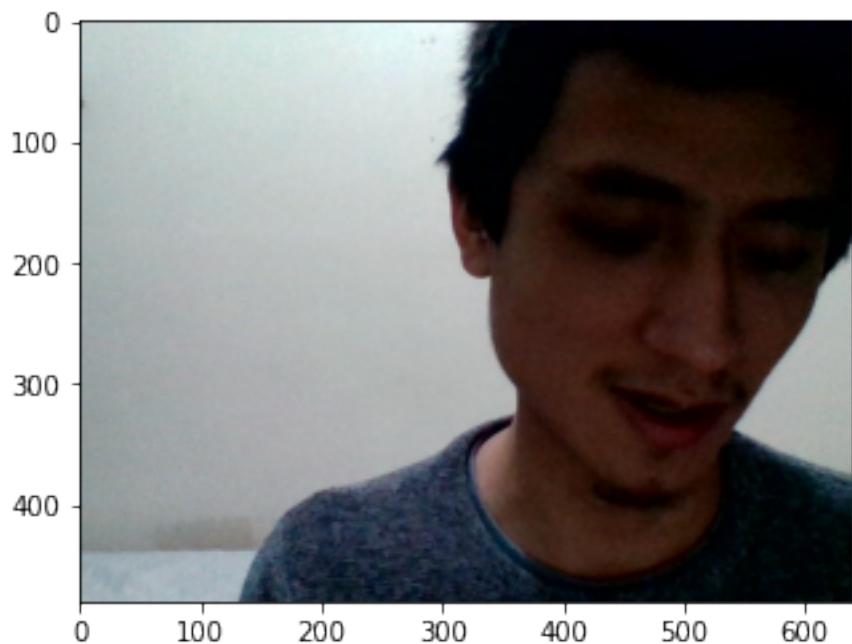
1/1 [=====] - 0s 21ms/step

No lleva Mascarilla - P. Comunitarias



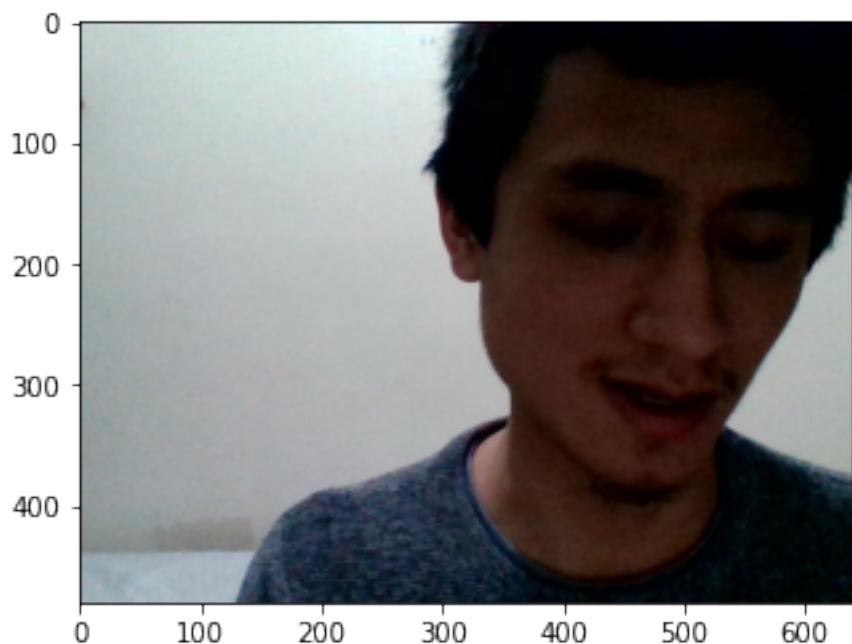
1/1 [=====] - 0s 23ms/step

No lleva Mascarilla - P. Comunitarias

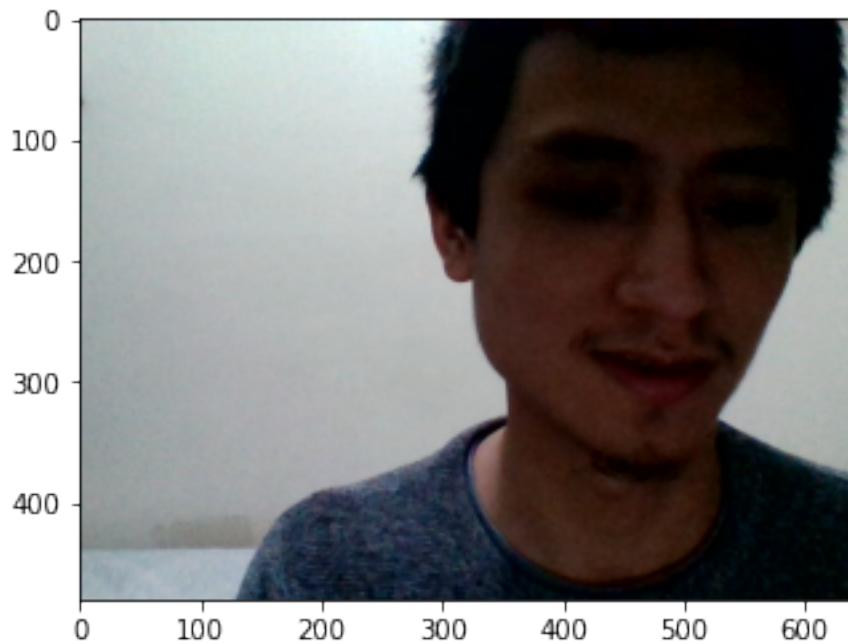


1/1 [=====] - 0s 27ms/step

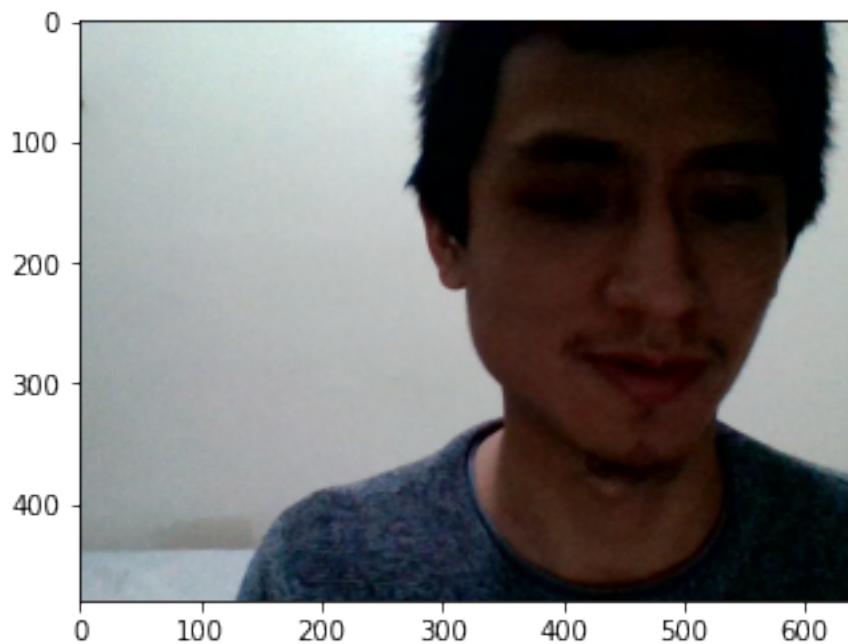
No lleva Mascarilla - P. Comunitarias



1/1 [=====] - 0s 20ms/step  
No lleva Mascarilla - P. Comunitarias

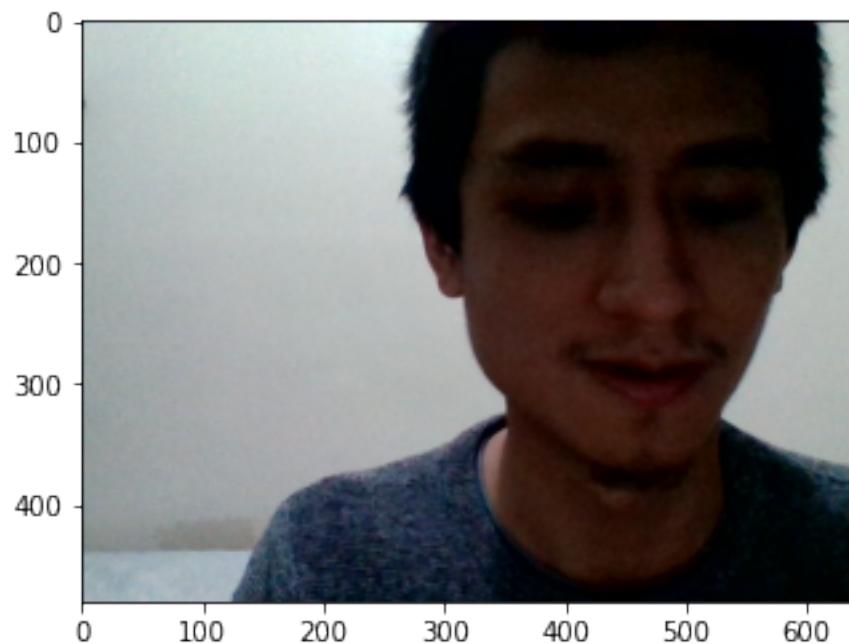


1/1 [=====] - 0s 21ms/step  
No lleva Mascarilla - P. Comunitarias



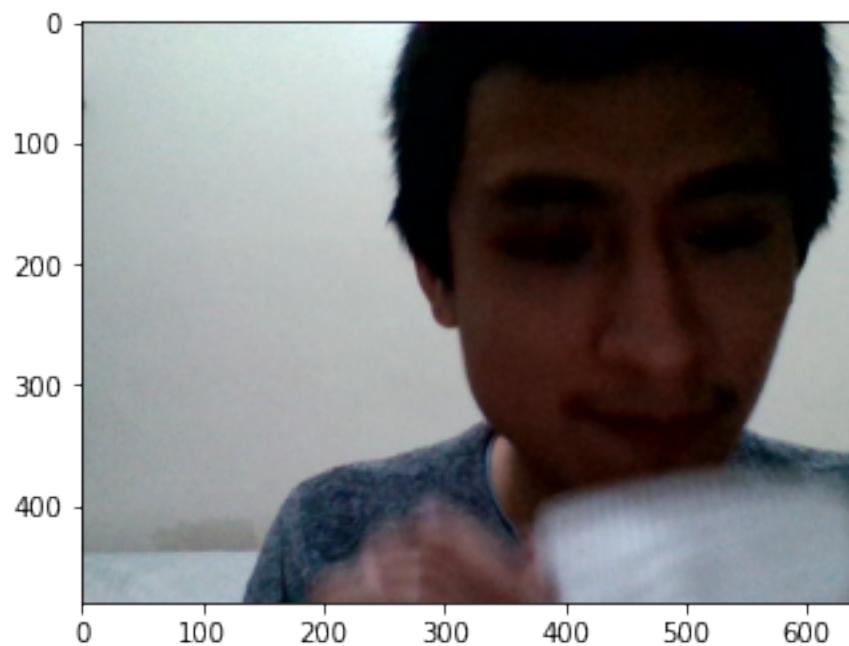
1/1 [=====] - 0s 28ms/step

No lleva Mascarilla - P. Comunitarias

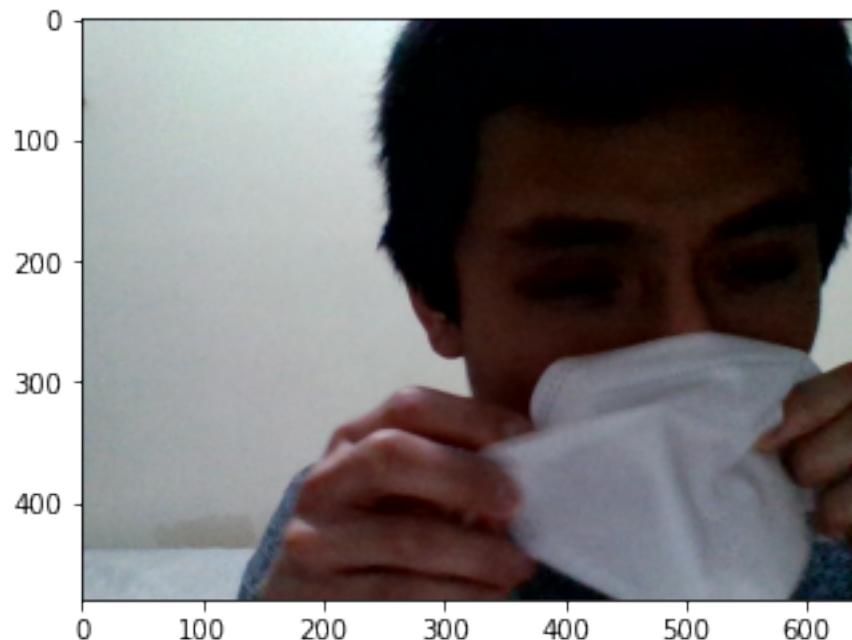


1/1 [=====] - 0s 21ms/step

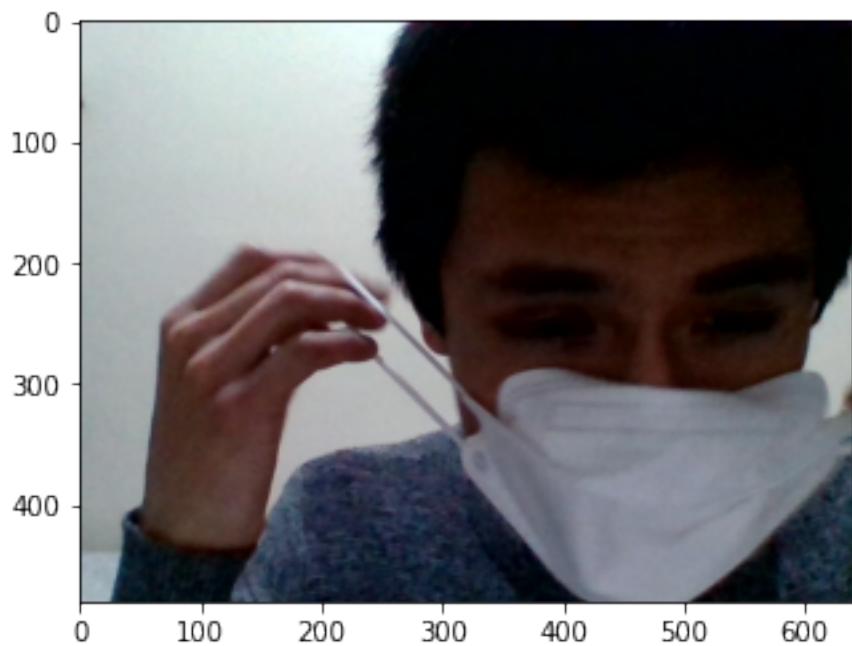
No lleva Mascarilla - P. Comunitarias



1/1 [=====] - 0s 21ms/step  
No lleva Mascarilla - P. Comunitarias

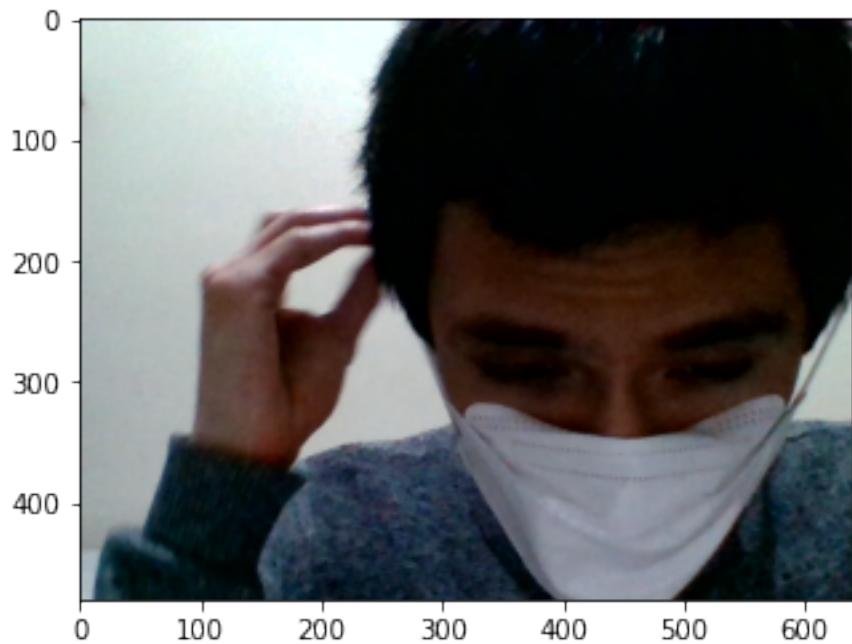


1/1 [=====] - 0s 21ms/step  
No lleva Mascarilla - P. Comunitarias



1/1 [=====] - 0s 31ms/step

Si lleva Macarilla - P.Comunitarias



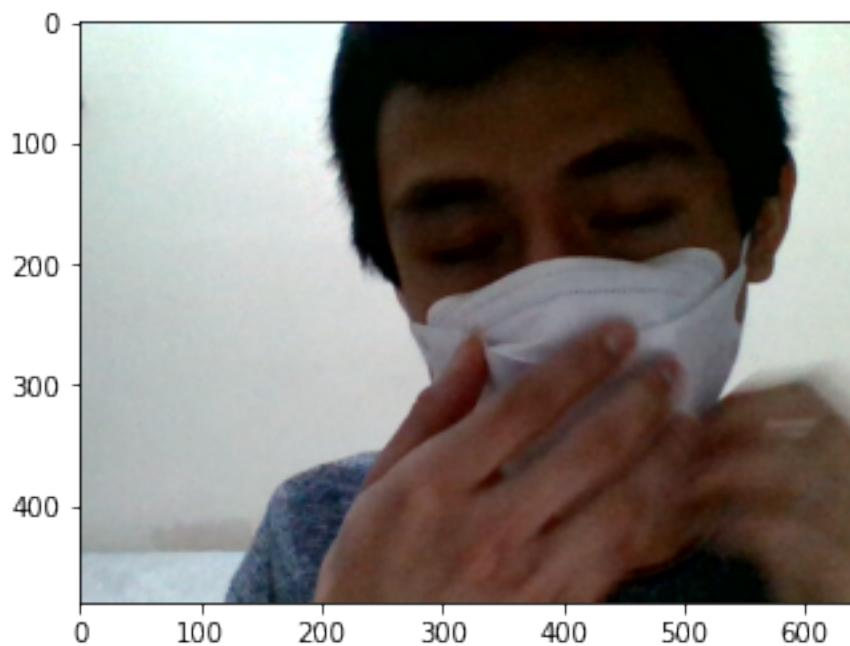
1/1 [=====] - 0s 21ms/step

No lleva Mascarilla - P. Comunitarias

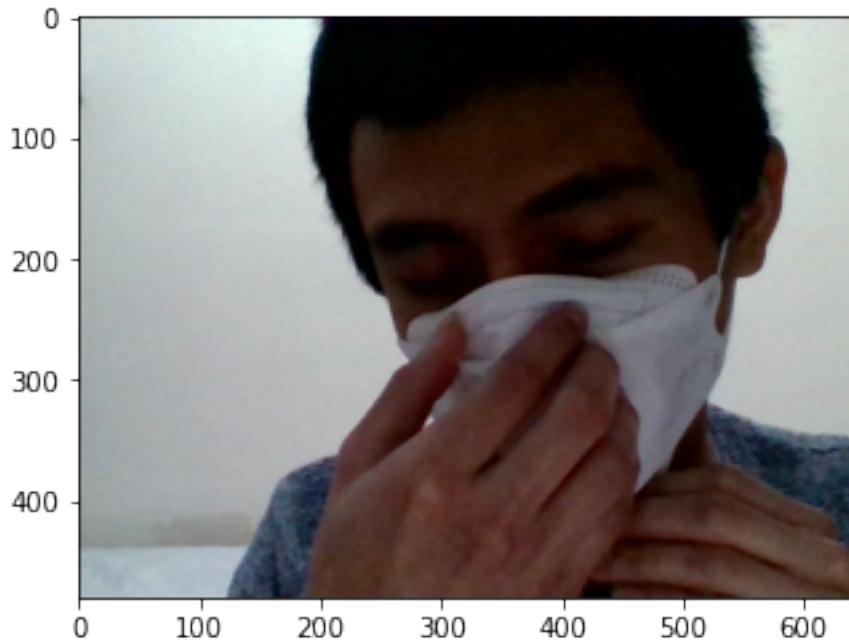


1/1 [=====] - 0s 32ms/step

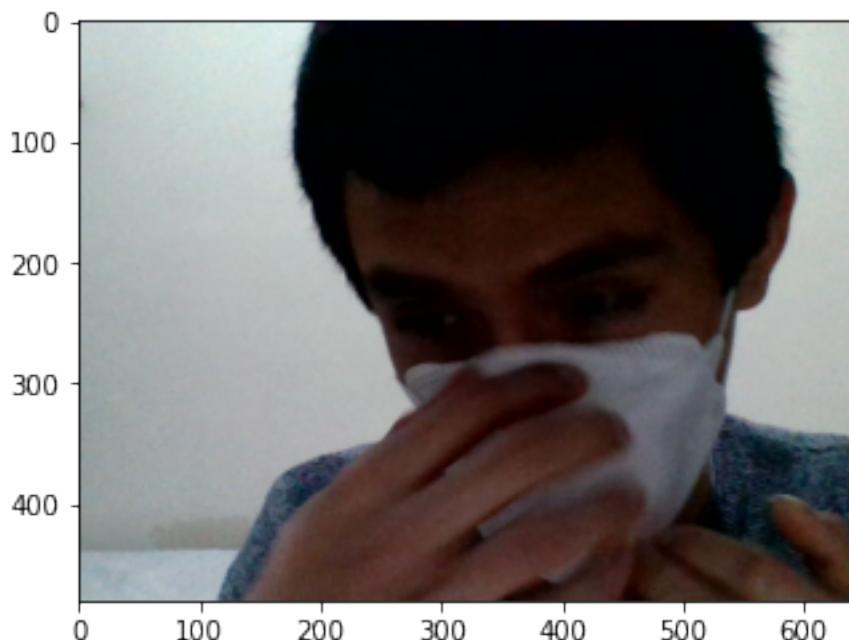
No lleva Mascarilla - P. Comunitarias



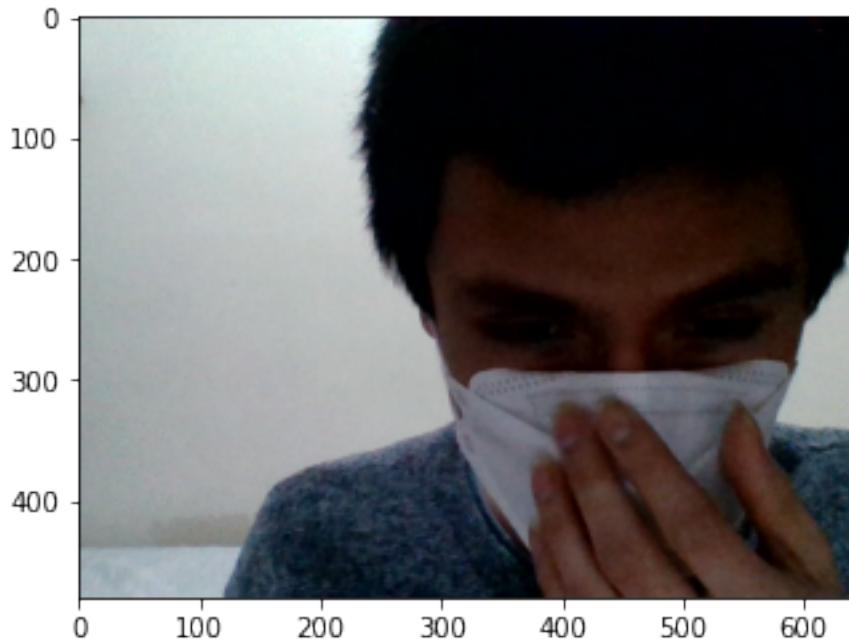
1/1 [=====] - 0s 21ms/step  
No lleva Mascarilla - P. Comunitarias



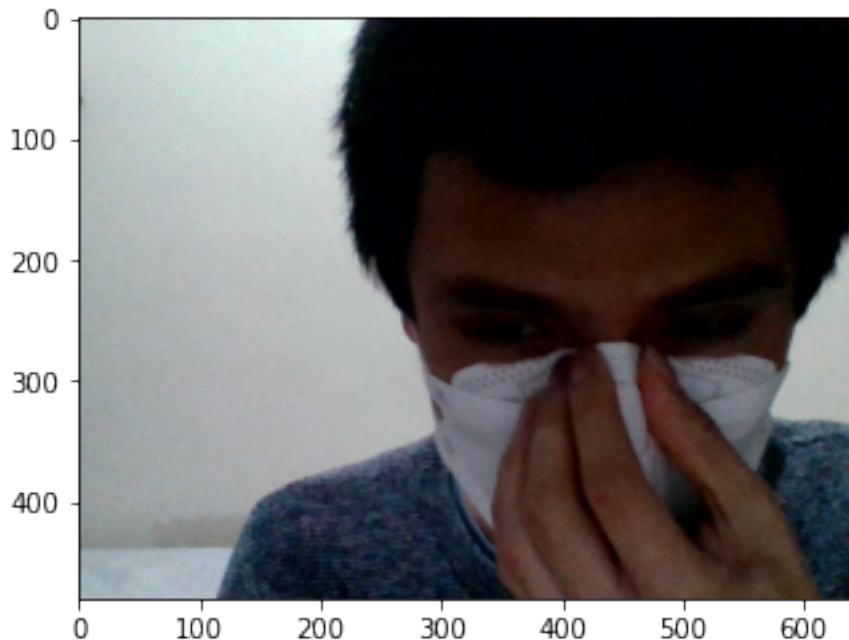
1/1 [=====] - 0s 21ms/step  
No lleva Mascarilla - P. Comunitarias



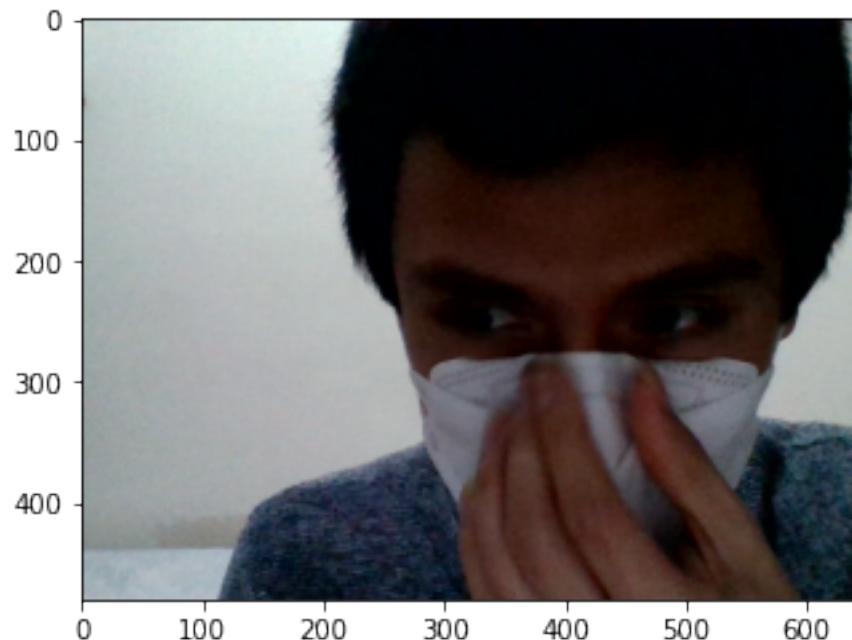
1/1 [=====] - 0s 22ms/step  
Si lleva Macarilla - P.Comunitarias



1/1 [=====] - 0s 20ms/step  
No lleva Mascarilla - P. Comunitarias



1/1 [=====] - 0s 20ms/step  
No lleva Mascarilla - P. Comunitarias



1/1 [=====] - 0s 21ms/step  
Si lleva Macarilla - P.Comunitarias



1/1 [=====] - 0s 22ms/step

Si lleva Macarilla - P.Comunitarias



1/1 [=====] - 0s 20ms/step

Si lleva Macarilla - P.Comunitarias

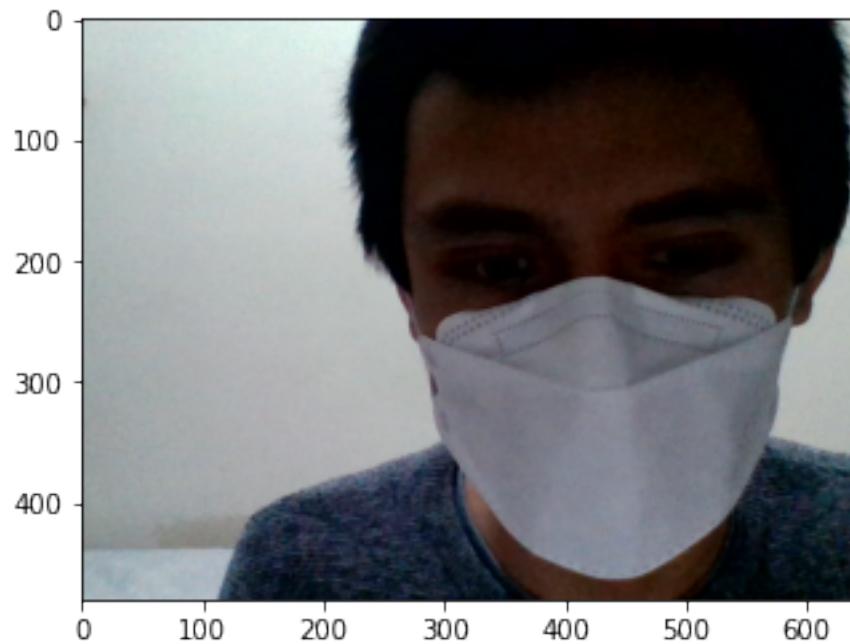


1/1 [=====] - 0s 21ms/step

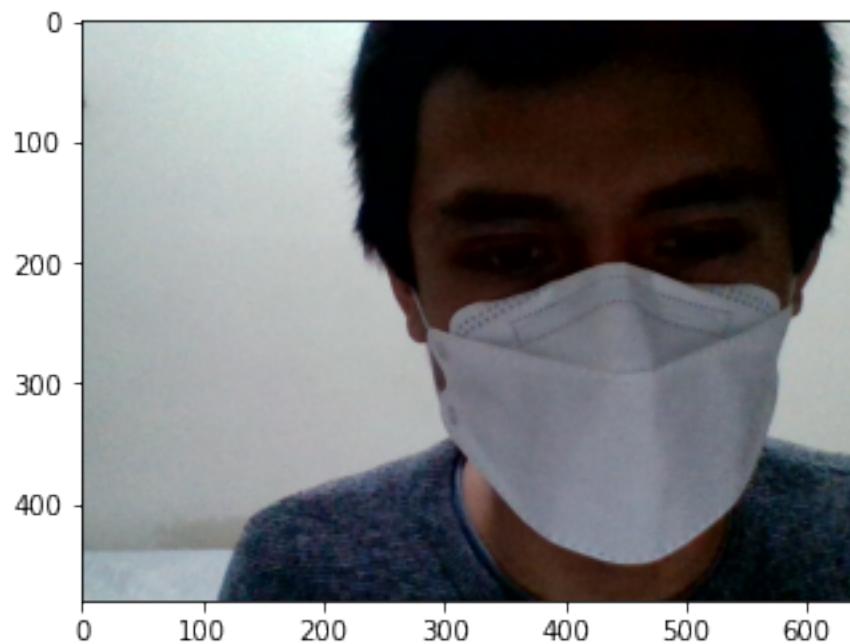
Si lleva Macarilla - P.Comunitarias



1/1 [=====] - 0s 20ms/step  
Si lleva Macarilla - P.Comunitarias



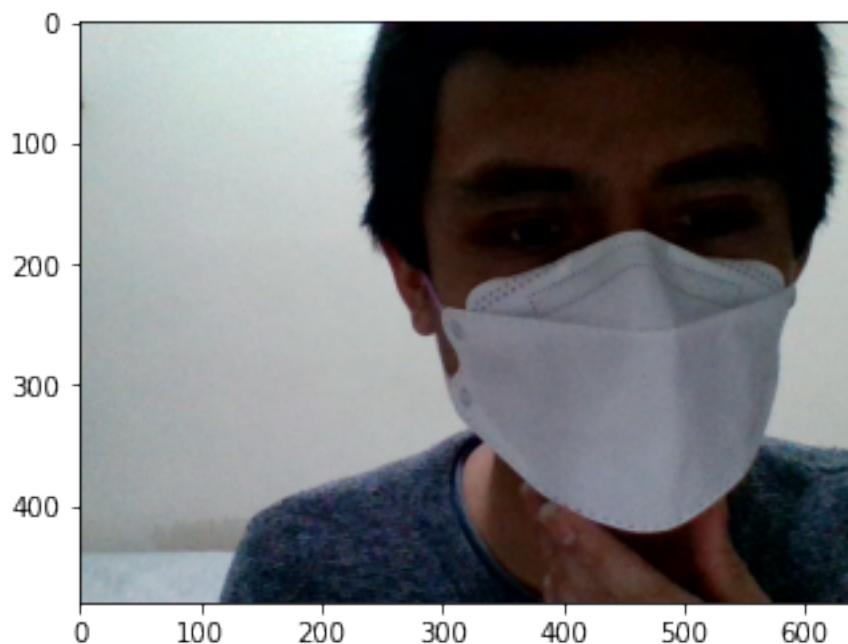
1/1 [=====] - 0s 22ms/step  
Si lleva Macarilla - P.Comunitarias



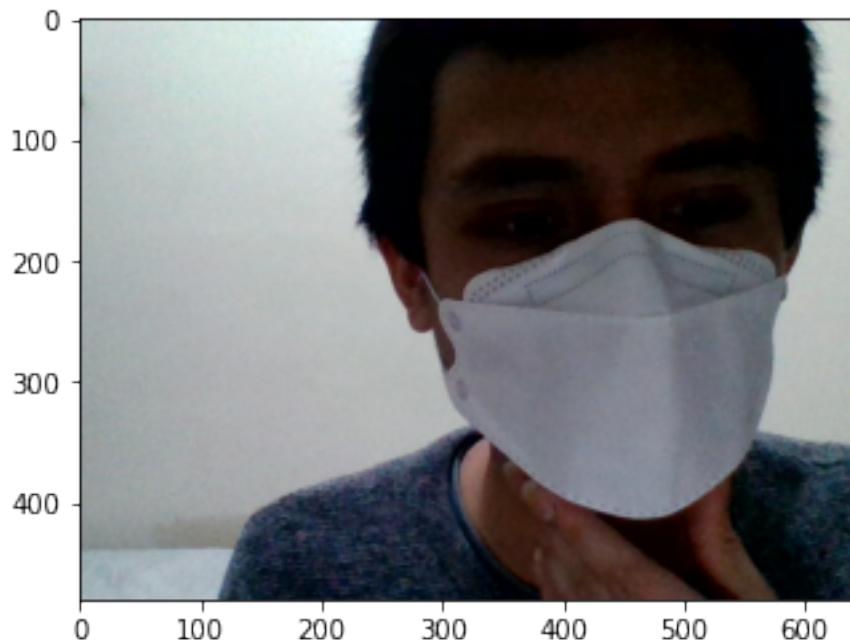
1/1 [=====] - 0s 22ms/step  
Si lleva Macarilla - P.Comunitarias



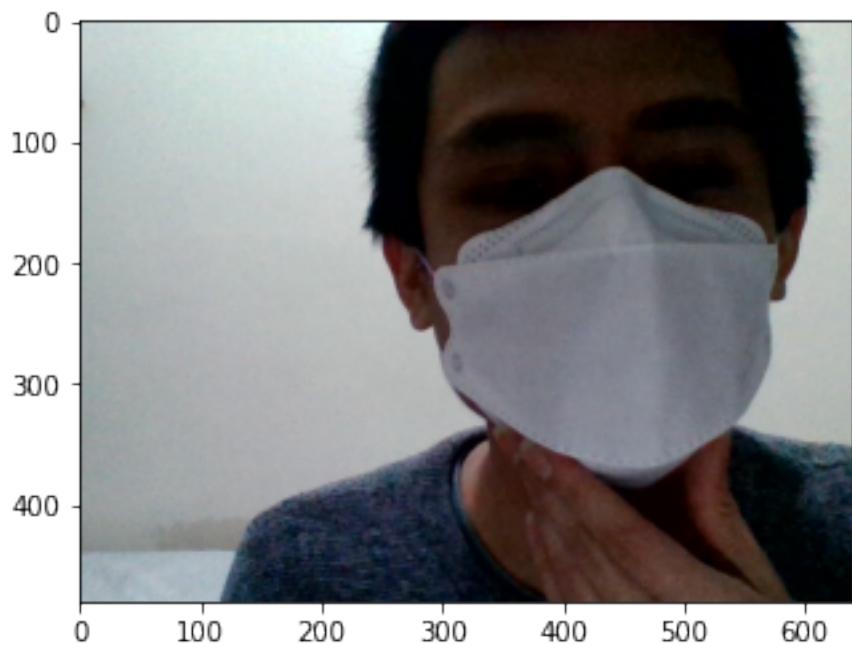
1/1 [=====] - 0s 36ms/step  
Si lleva Macarilla - P.Comunitarias



1/1 [=====] - 0s 34ms/step  
Si lleva Macarilla - P.Comunitarias



1/1 [=====] - 0s 25ms/step  
Si lleva Macarilla - P.Comunitarias



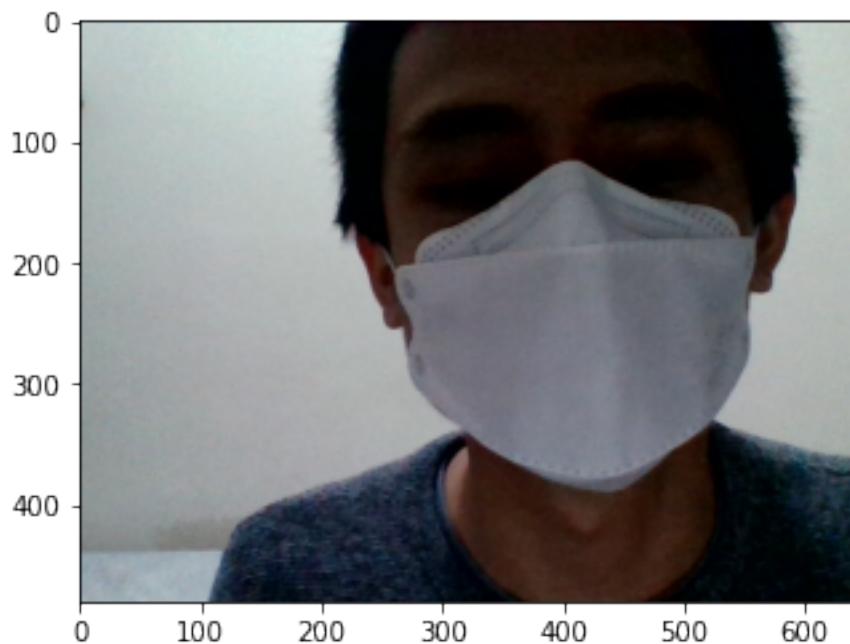
1/1 [=====] - 0s 21ms/step

Si lleva Macarilla - P.Comunitarias



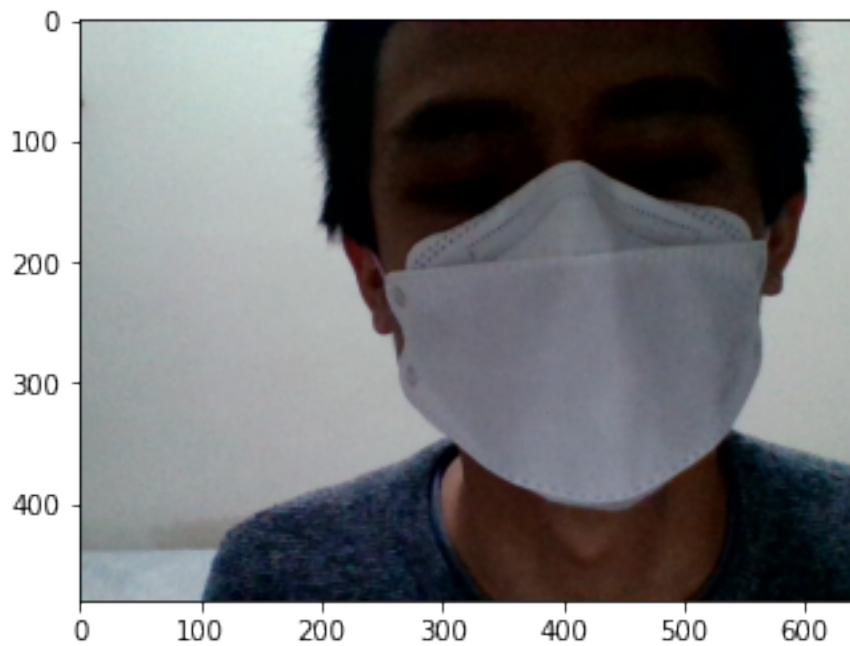
1/1 [=====] - 0s 21ms/step

Si lleva Macarilla - P.Comunitarias

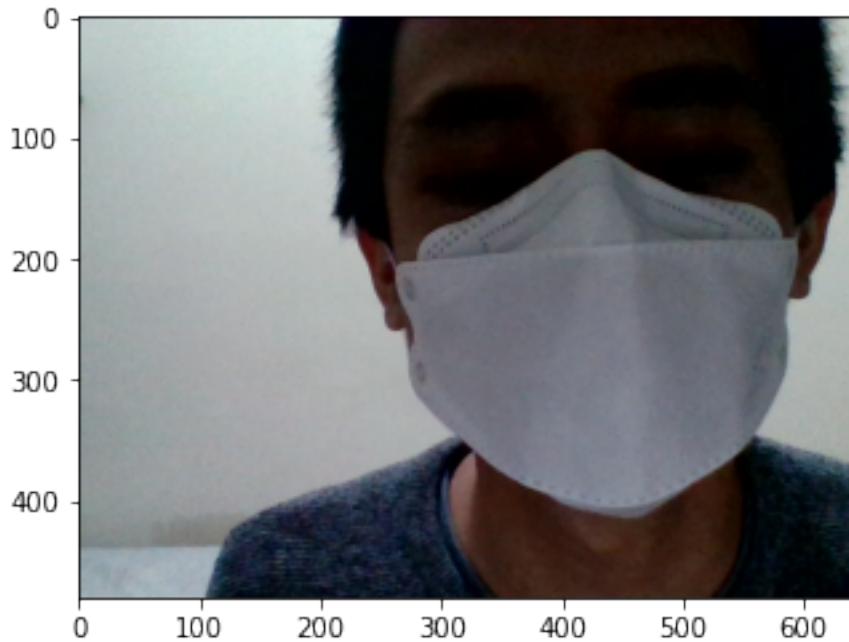


1/1 [=====] - 0s 22ms/step

Si lleva Macarilla - P.Comunitarias



1/1 [=====] - 0s 22ms/step  
Si lleva Macarilla - P.Comunitarias

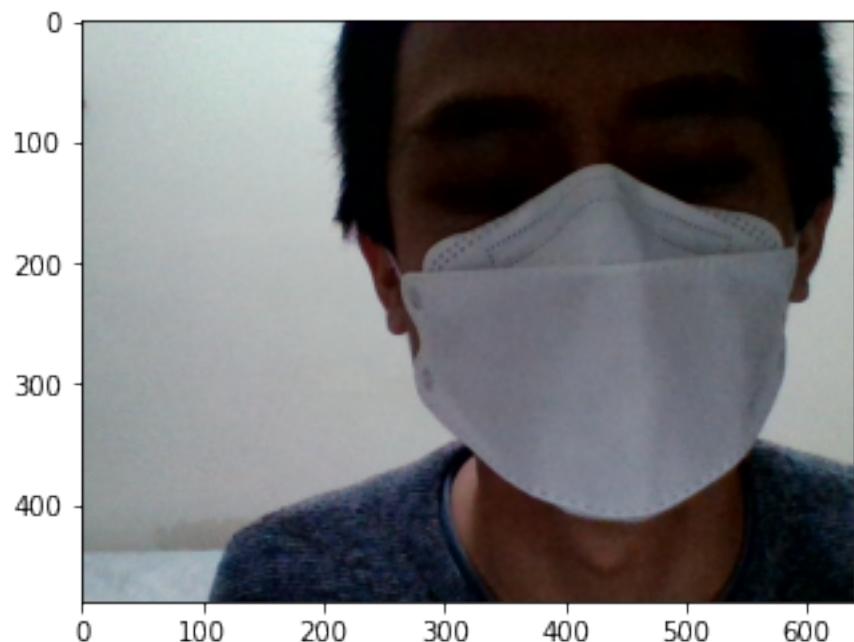


1/1 [=====] - 0s 24ms/step  
Si lleva Macarilla - P.Comunitarias



1/1 [=====] - 0s 23ms/step

Si lleva Macarilla - P.Comunitarias

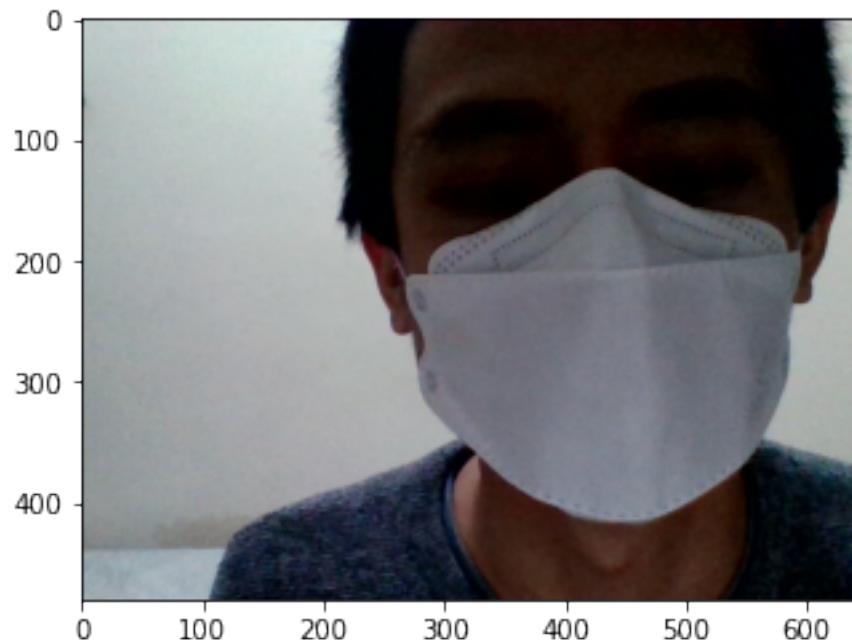


1/1 [=====] - 0s 22ms/step

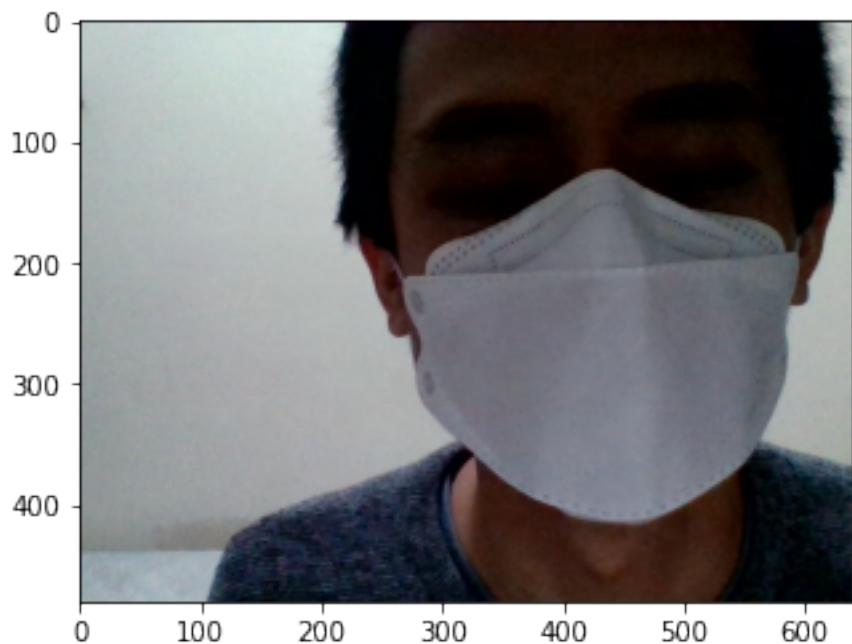
Si lleva Macarilla - P.Comunitarias



1/1 [=====] - 0s 20ms/step  
Si lleva Macarilla - P.Comunitarias

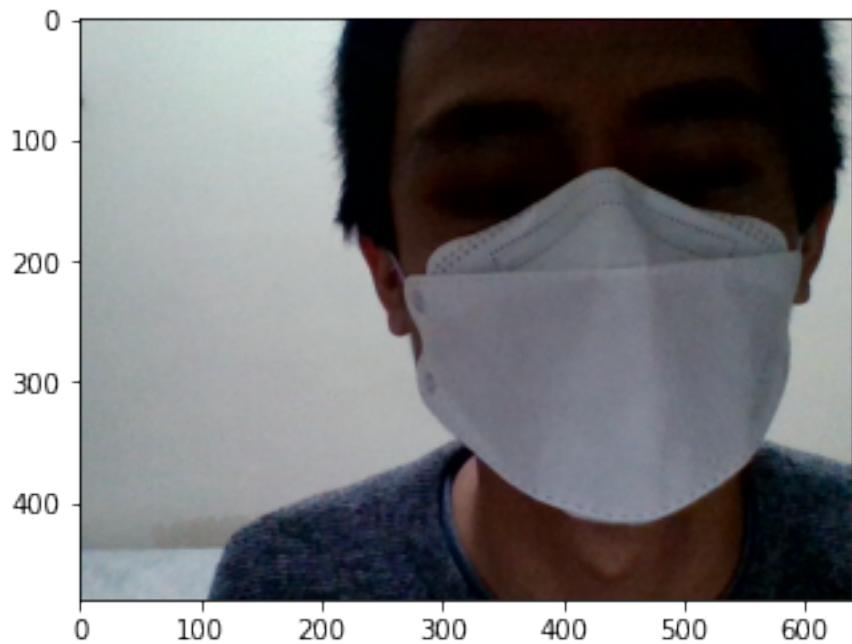


1/1 [=====] - 0s 22ms/step  
Si lleva Macarilla - P.Comunitarias



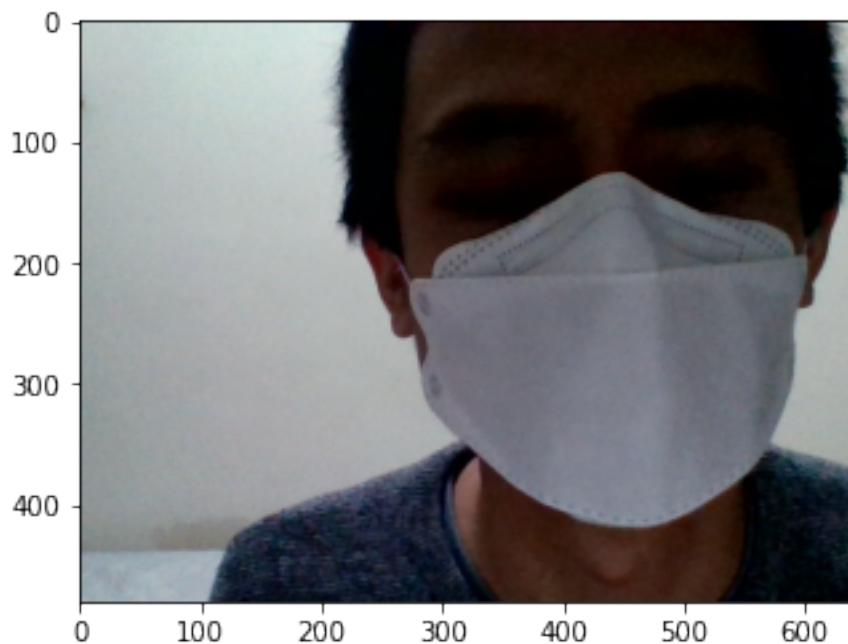
1/1 [=====] - 0s 20ms/step

Si lleva Macarilla - P.Comunitarias



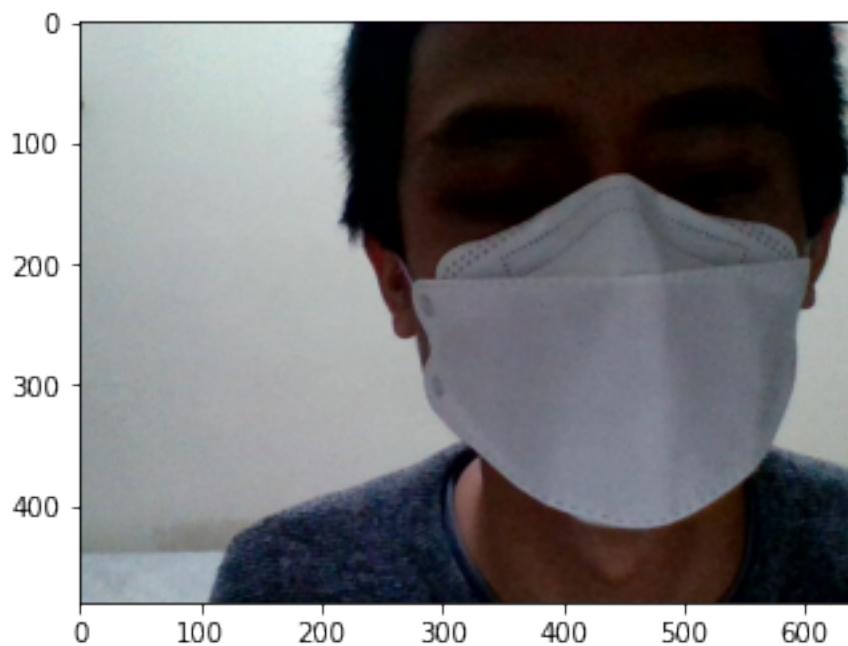
1/1 [=====] - 0s 21ms/step

Si lleva Macarilla - P.Comunitarias

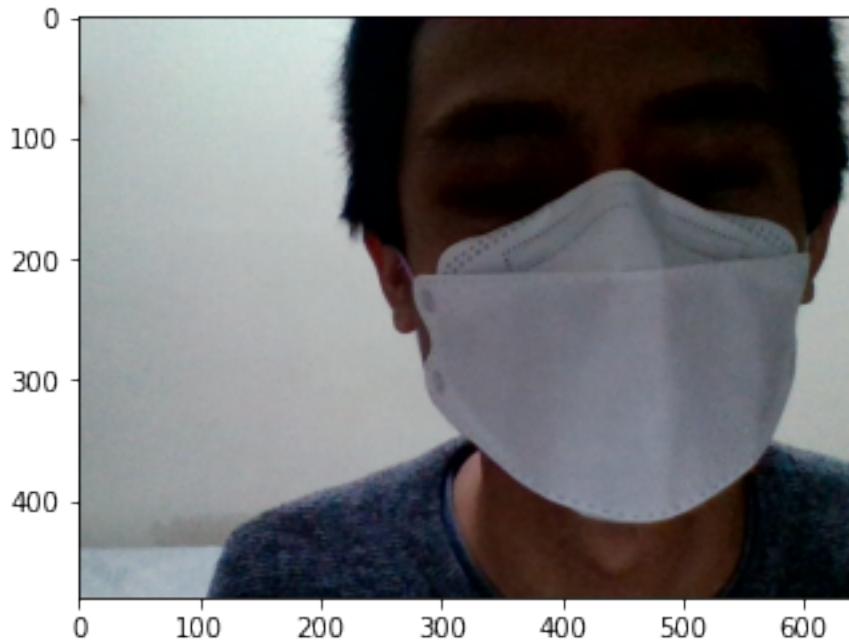


1/1 [=====] - 0s 20ms/step

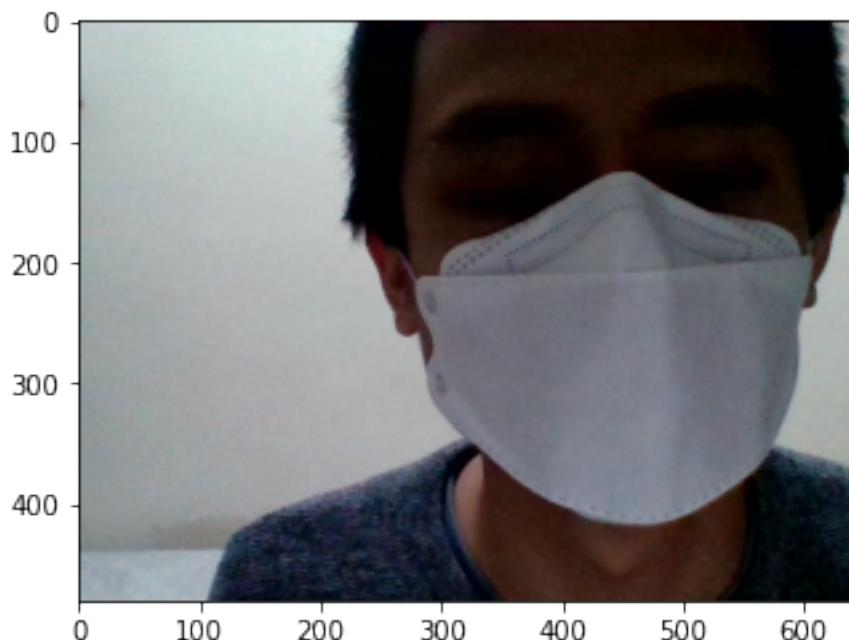
Si lleva Macarilla - P.Comunitarias



1/1 [=====] - 0s 30ms/step  
Si lleva Macarilla - P.Comunitarias

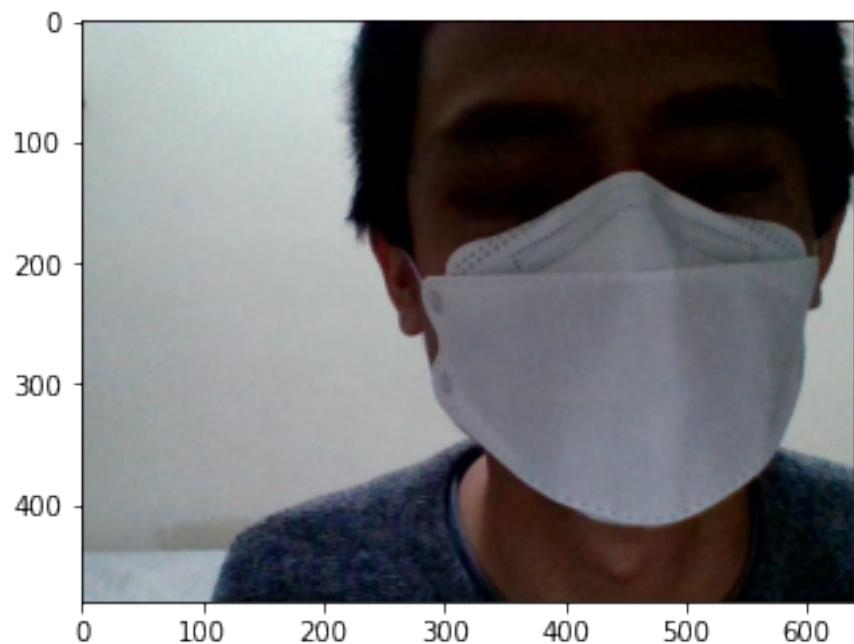


1/1 [=====] - 0s 23ms/step  
Si lleva Macarilla - P.Comunitarias



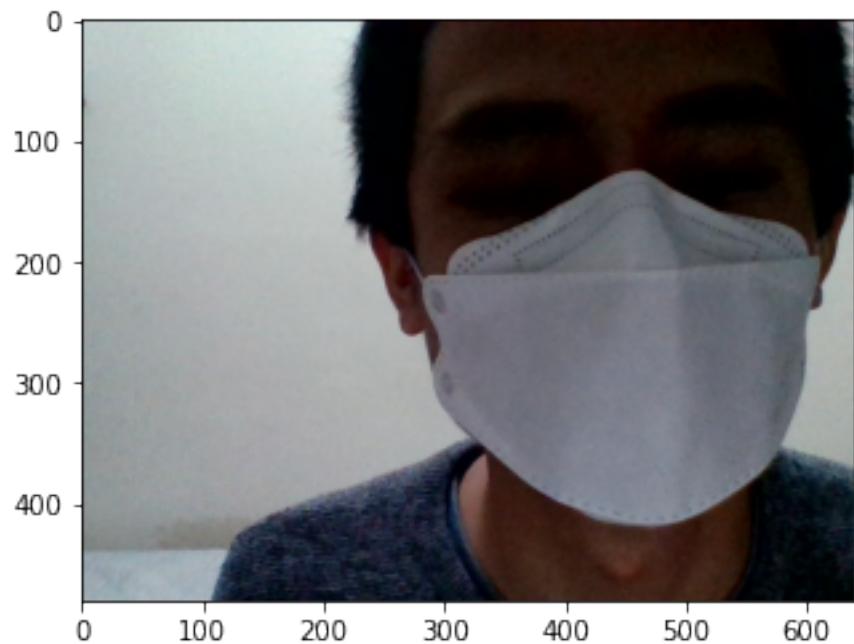
1/1 [=====] - 0s 21ms/step

Si lleva Macarilla - P.Comunitarias



1/1 [=====] - 0s 21ms/step

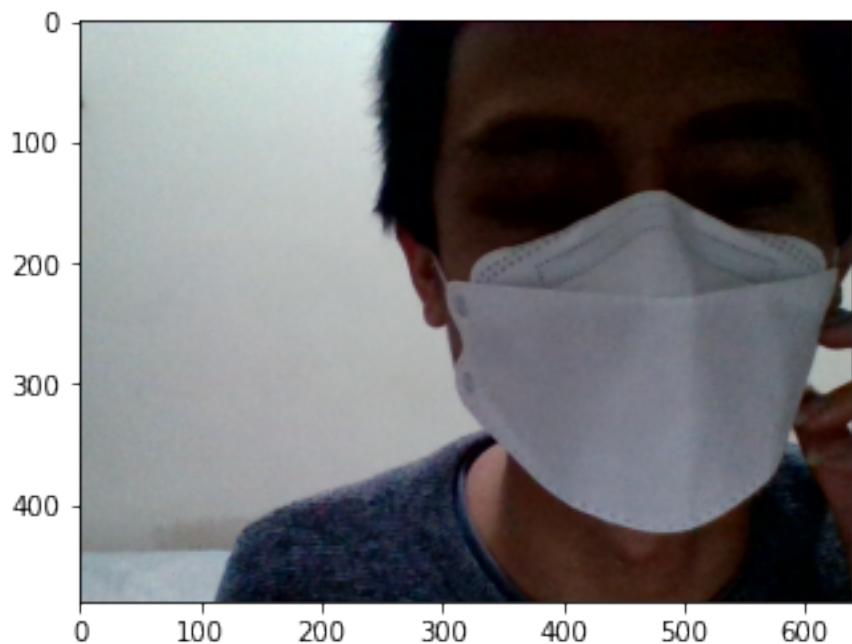
Si lleva Macarilla - P.Comunitarias



1/1 [=====] - 0s 22ms/step  
Si lleva Macarilla - P.Comunitarias



1/1 [=====] - 0s 21ms/step  
Si lleva Macarilla - P.Comunitarias



1/1 [=====] - 0s 23ms/step

Si lleva Macarilla - P.Comunitarias



1/1 [=====] - 0s 31ms/step

Si lleva Macarilla - P.Comunitarias

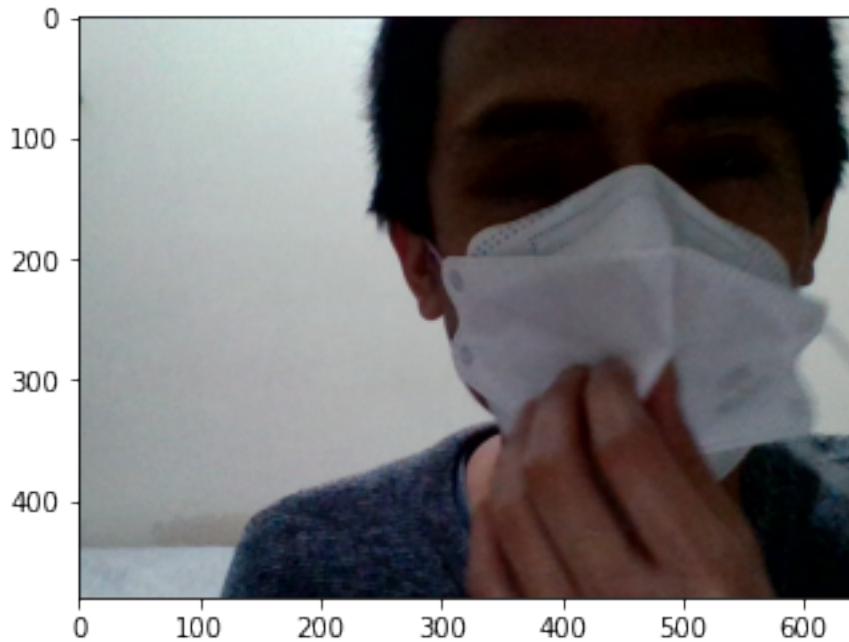


1/1 [=====] - 0s 26ms/step

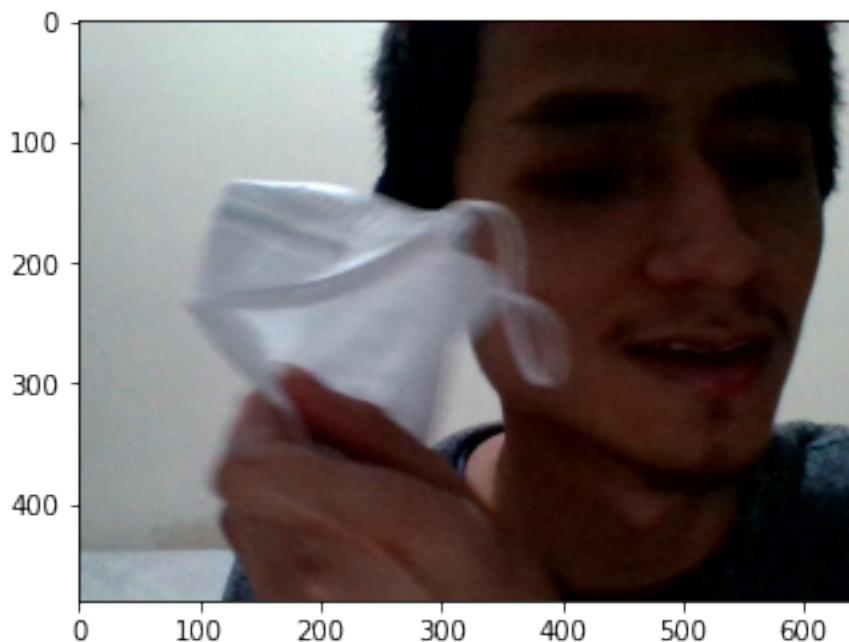
Si lleva Macarilla - P.Comunitarias



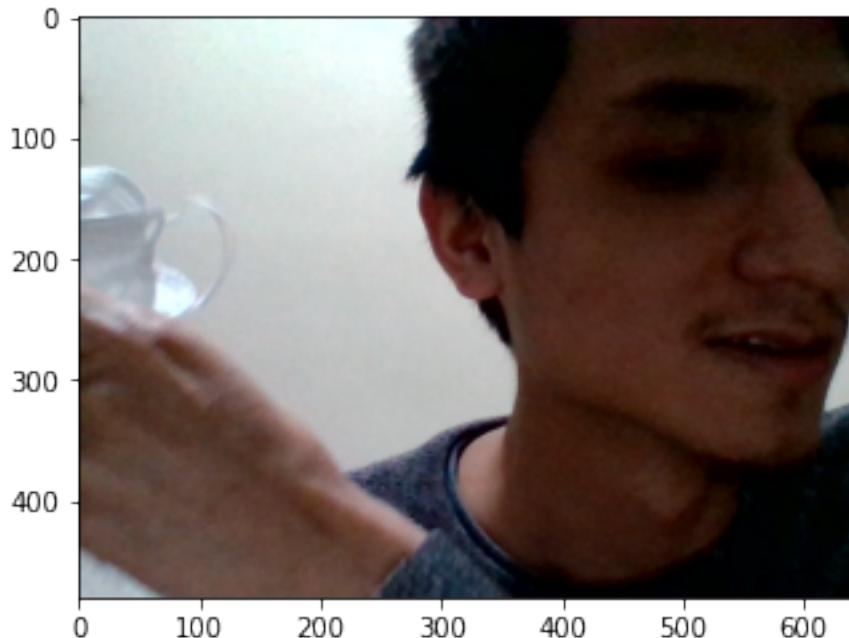
1/1 [=====] - 0s 22ms/step  
Si lleva Macarilla - P.Comunitarias



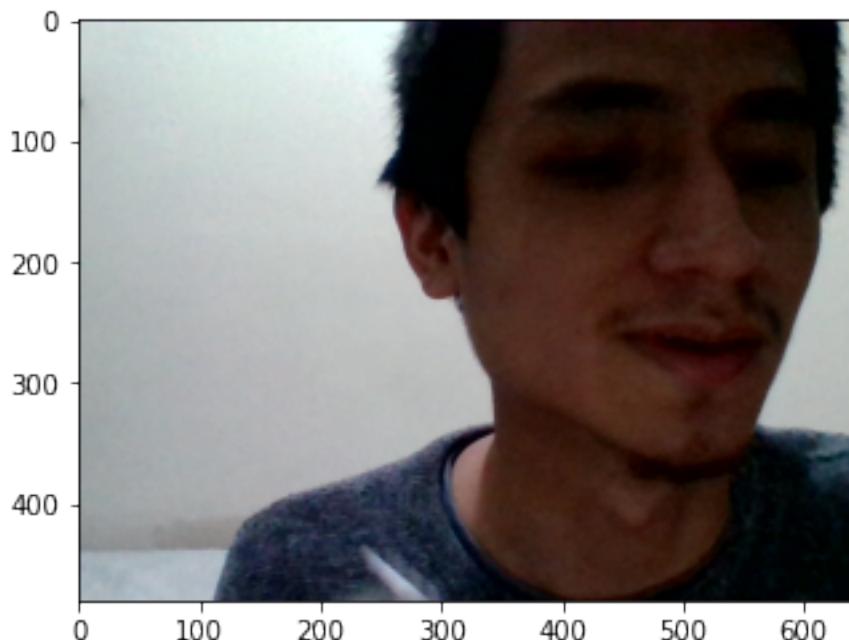
1/1 [=====] - 0s 22ms/step  
Si lleva Macarilla - P.Comunitarias



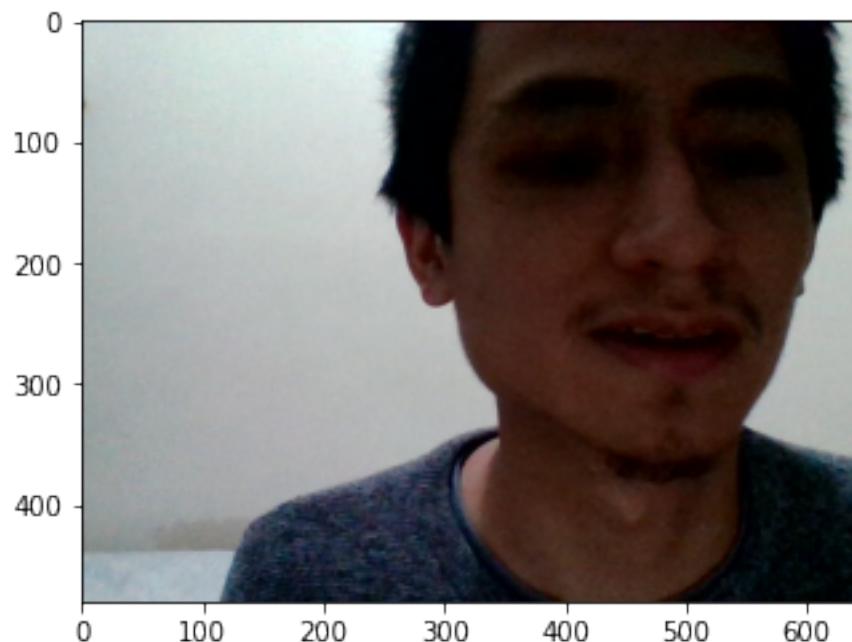
1/1 [=====] - 0s 21ms/step  
Si lleva Macarilla - P.Comunitarias



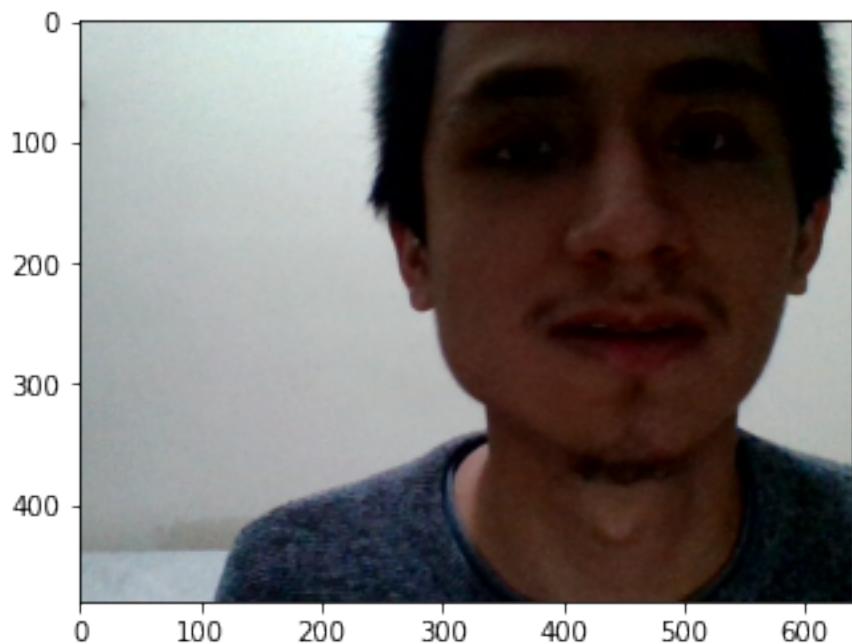
1/1 [=====] - 0s 21ms/step  
No lleva Mascarilla - P. Comunitarias



1/1 [=====] - 0s 43ms/step  
No lleva Mascarilla - P. Comunitarias

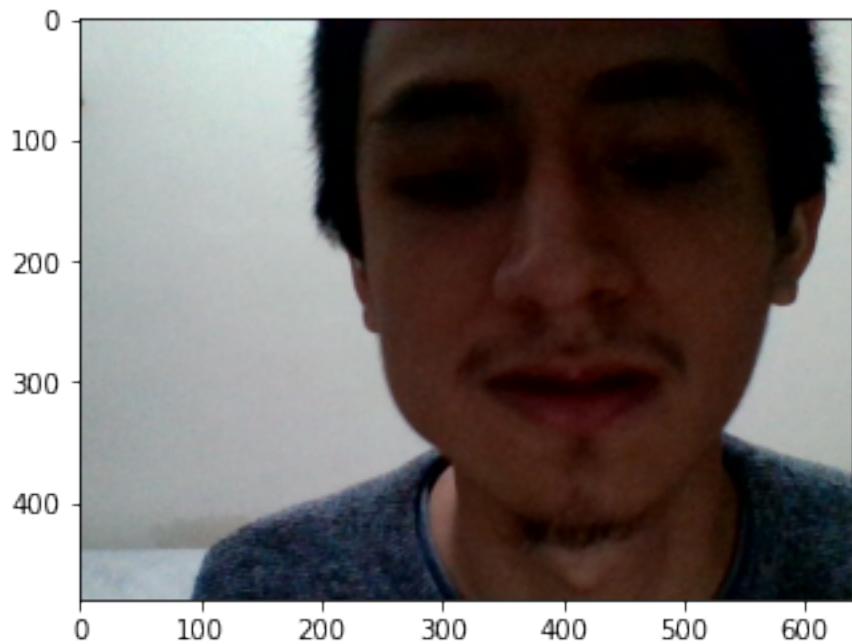


1/1 [=====] - 0s 21ms/step  
No lleva Mascarilla - P. Comunitarias



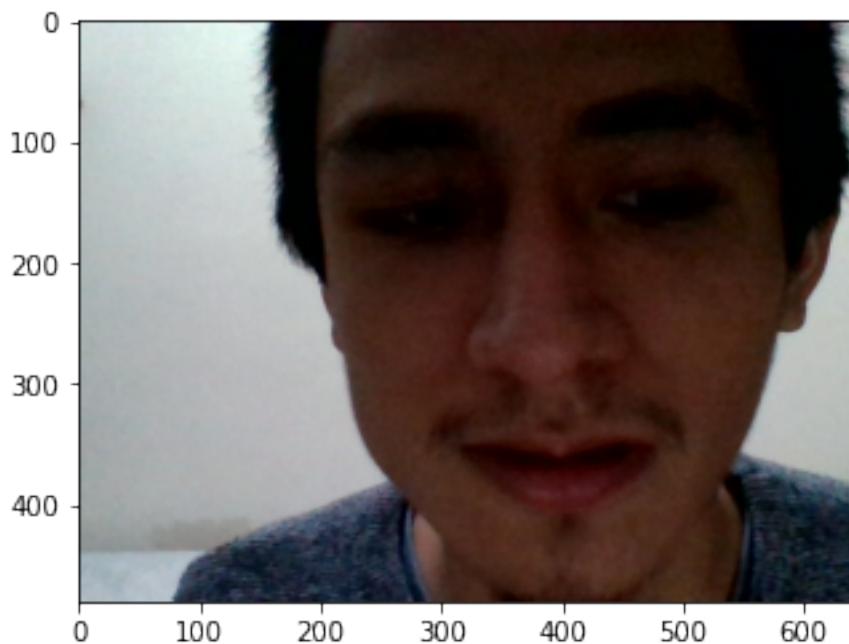
1/1 [=====] - 0s 25ms/step

No lleva Mascarilla - P. Comunitarias



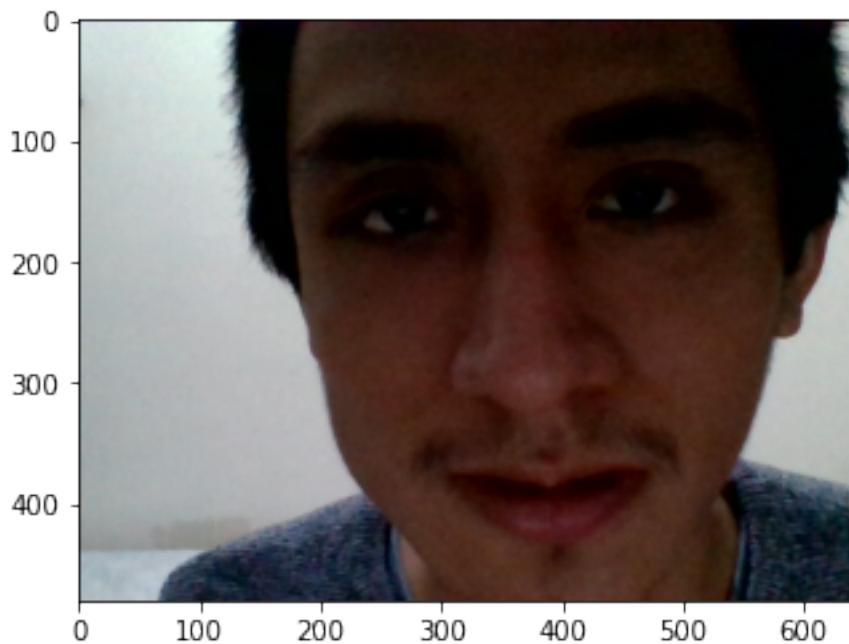
1/1 [=====] - 0s 36ms/step

No lleva Mascarilla - P. Comunitarias

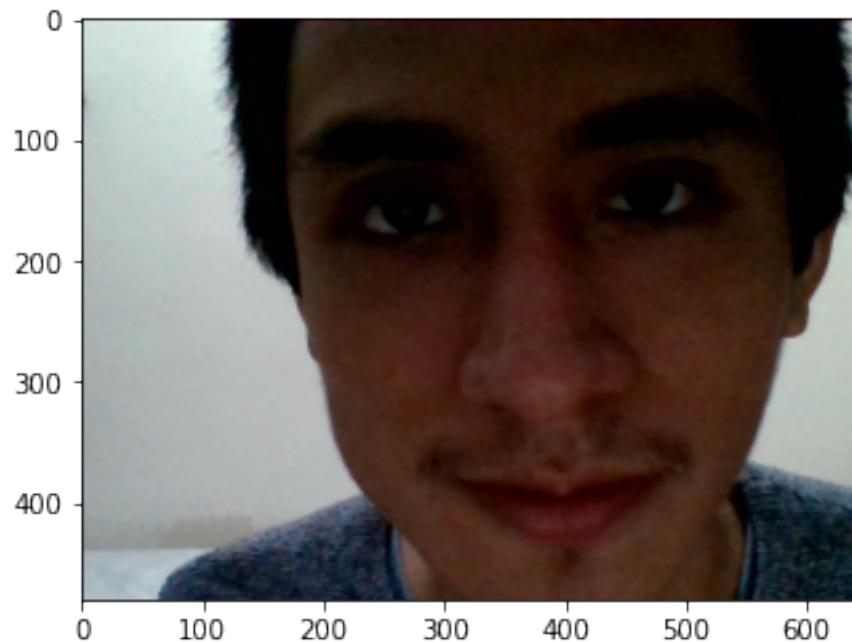


1/1 [=====] - 0s 22ms/step

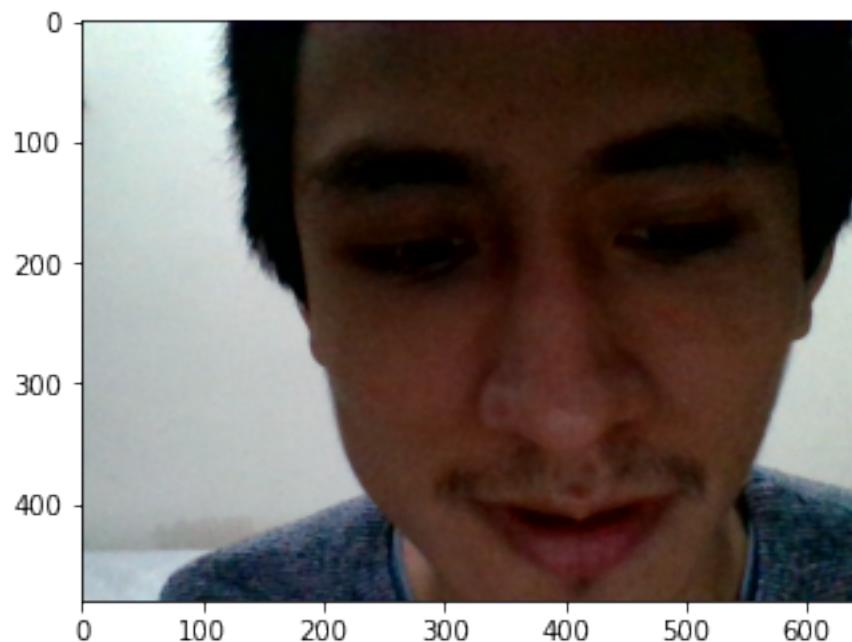
No lleva Mascarilla - P. Comunitarias



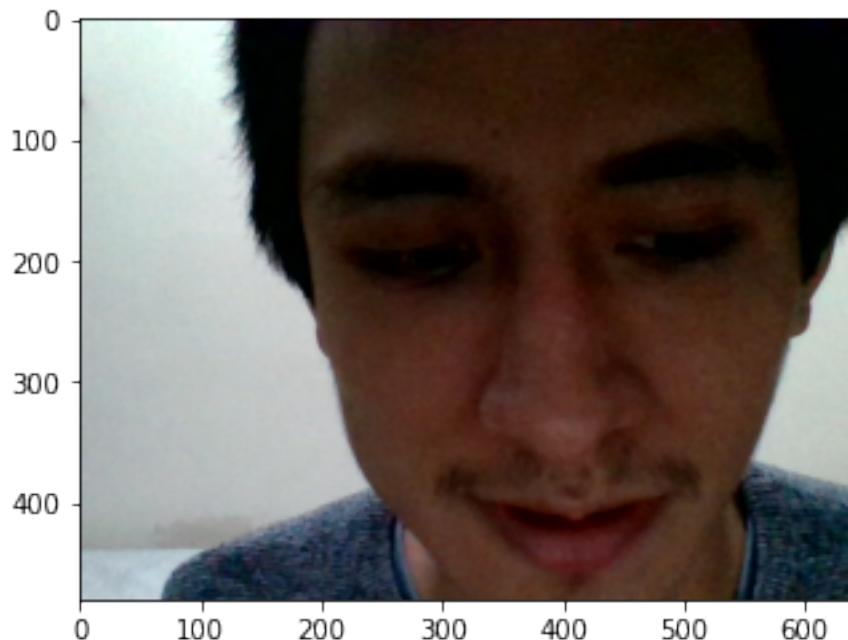
1/1 [=====] - 0s 28ms/step  
No lleva Mascarilla - P. Comunitarias



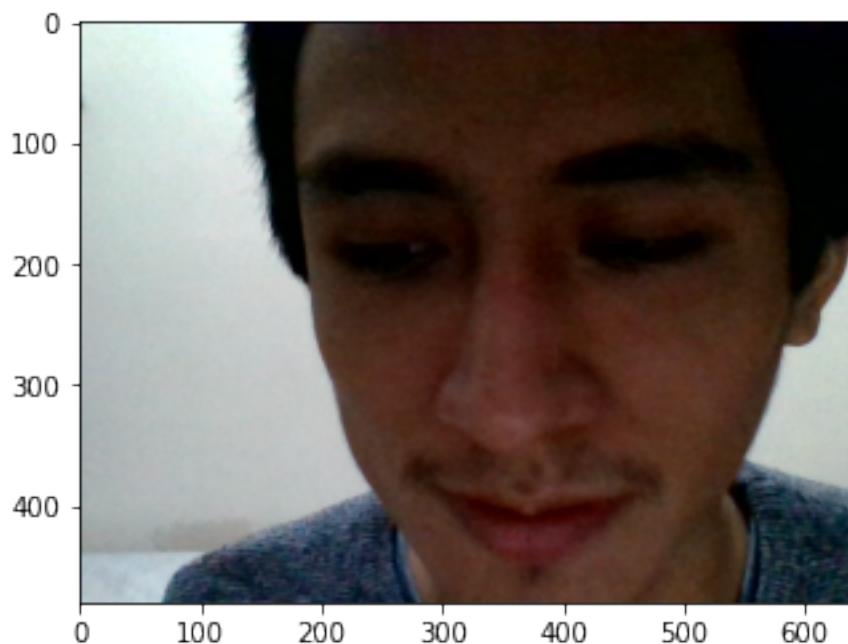
1/1 [=====] - 0s 25ms/step  
No lleva Mascarilla - P. Comunitarias



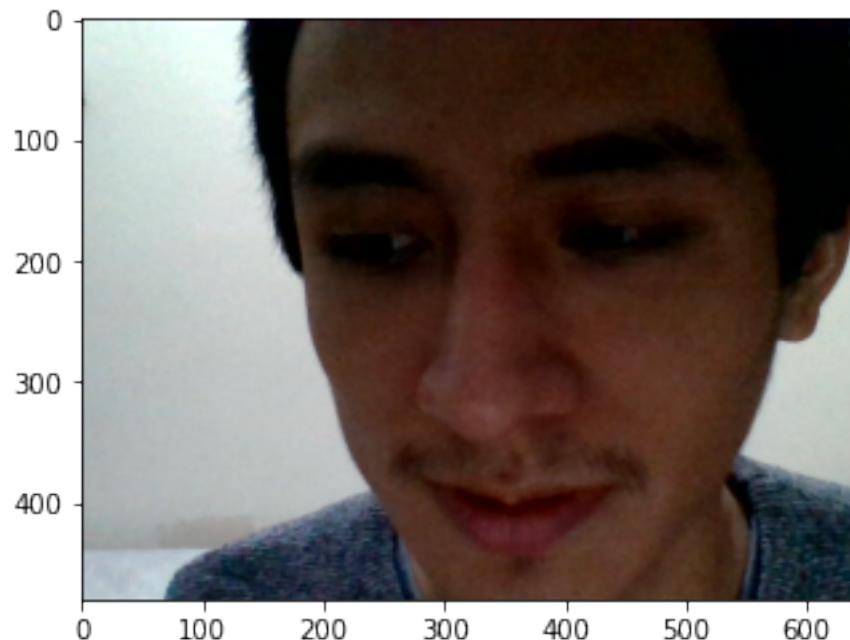
1/1 [=====] - 0s 21ms/step  
No lleva Mascarilla - P. Comunitarias



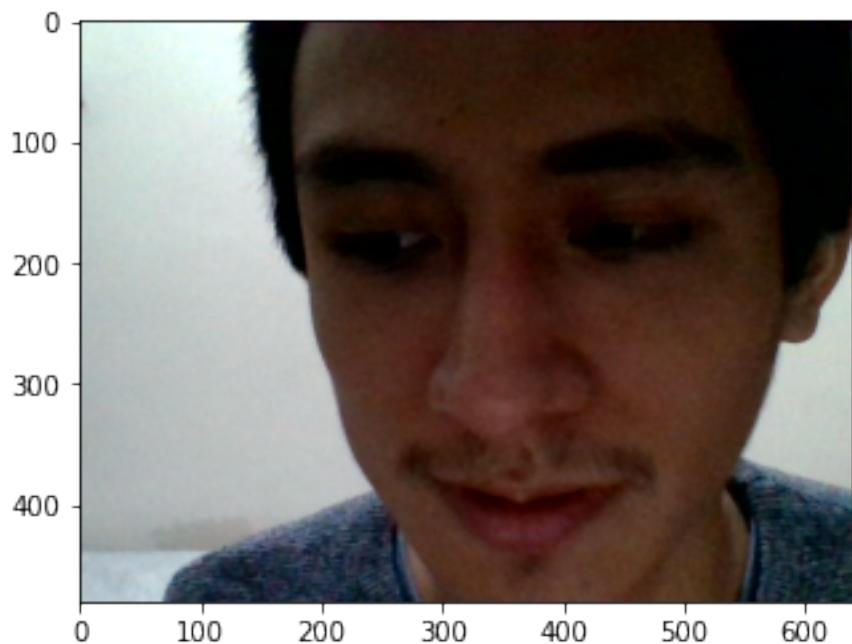
1/1 [=====] - 0s 23ms/step  
No lleva Mascarilla - P. Comunitarias



1/1 [=====] - 0s 20ms/step  
No lleva Mascarilla - P. Comunitarias

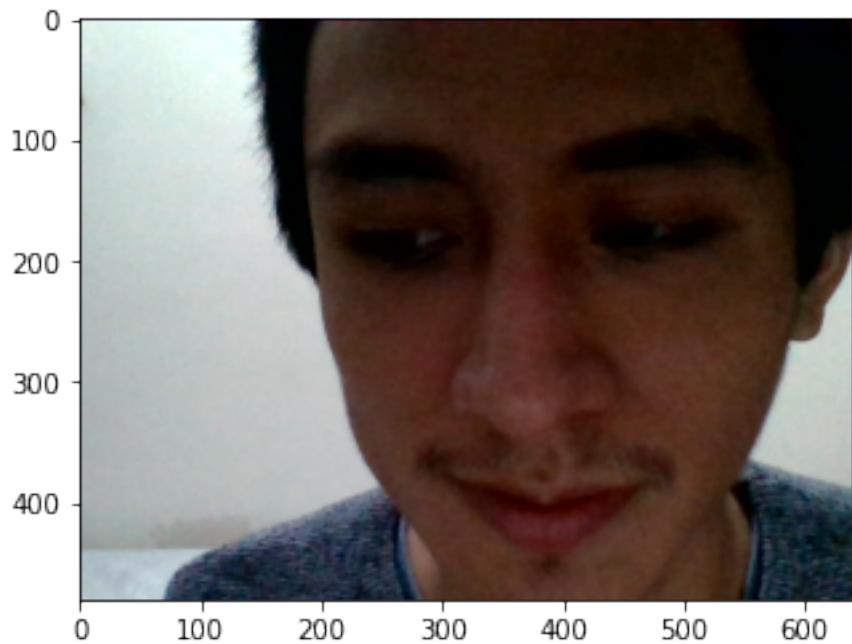


1/1 [=====] - 0s 20ms/step  
No lleva Mascarilla - P. Comunitarias



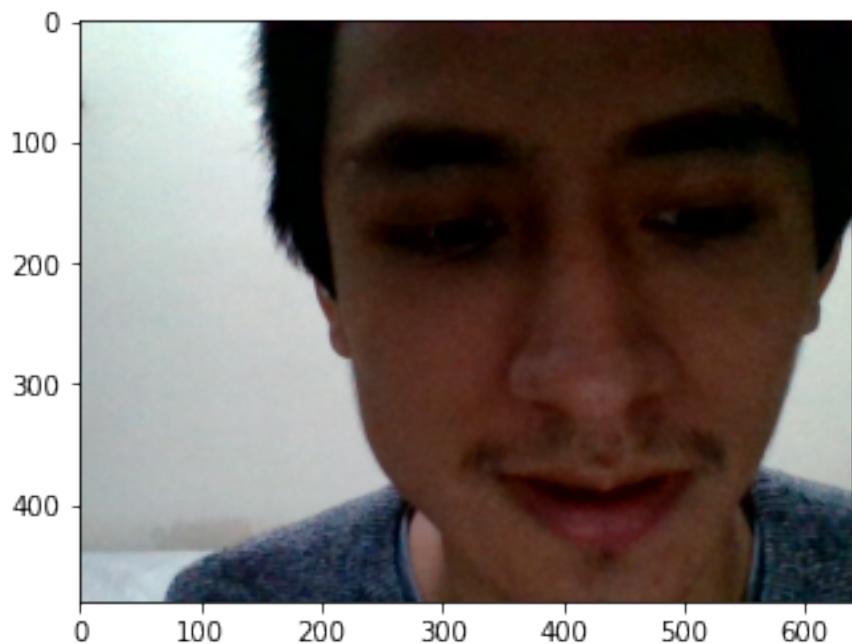
1/1 [=====] - 0s 21ms/step

No lleva Mascarilla - P. Comunitarias



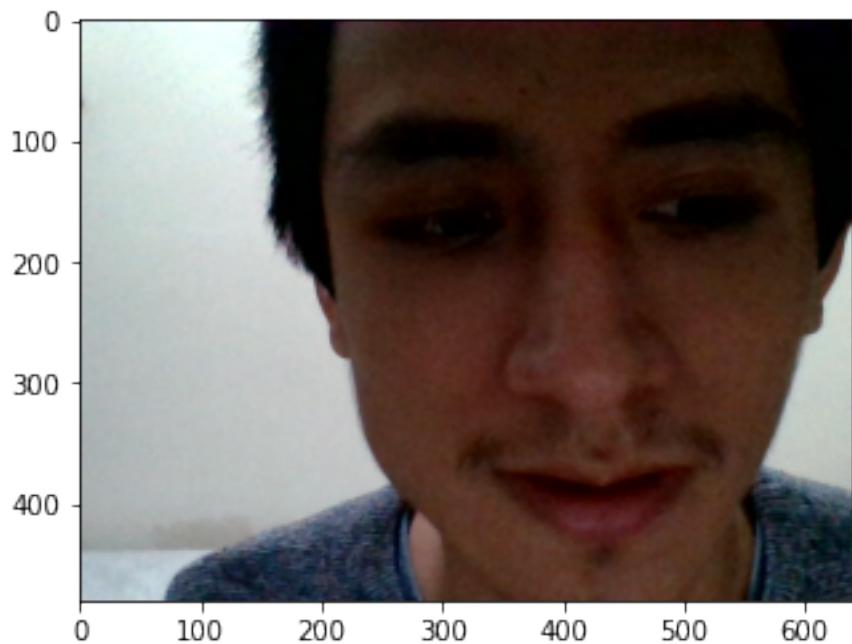
1/1 [=====] - 0s 20ms/step

No lleva Mascarilla - P. Comunitarias

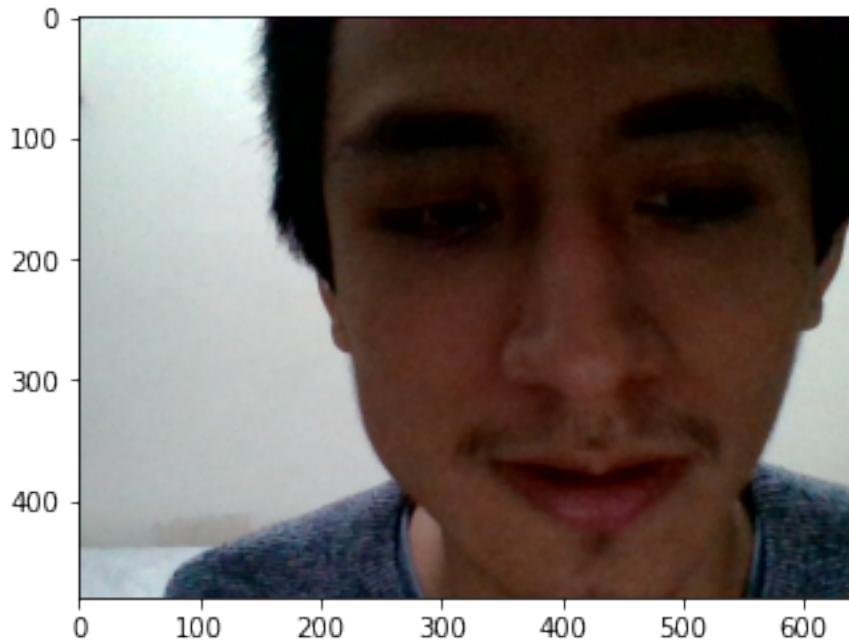


1/1 [=====] - 0s 20ms/step

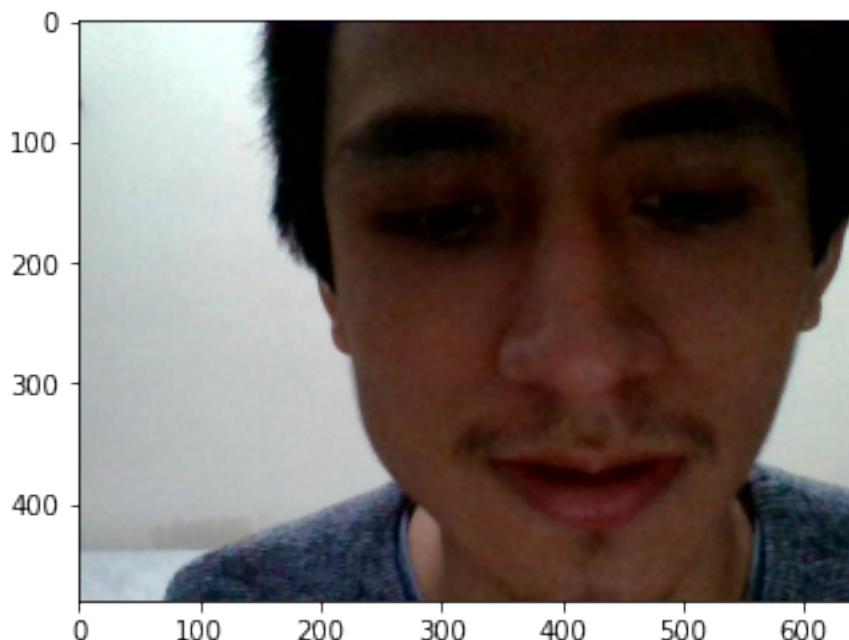
No lleva Mascarilla - P. Comunitarias



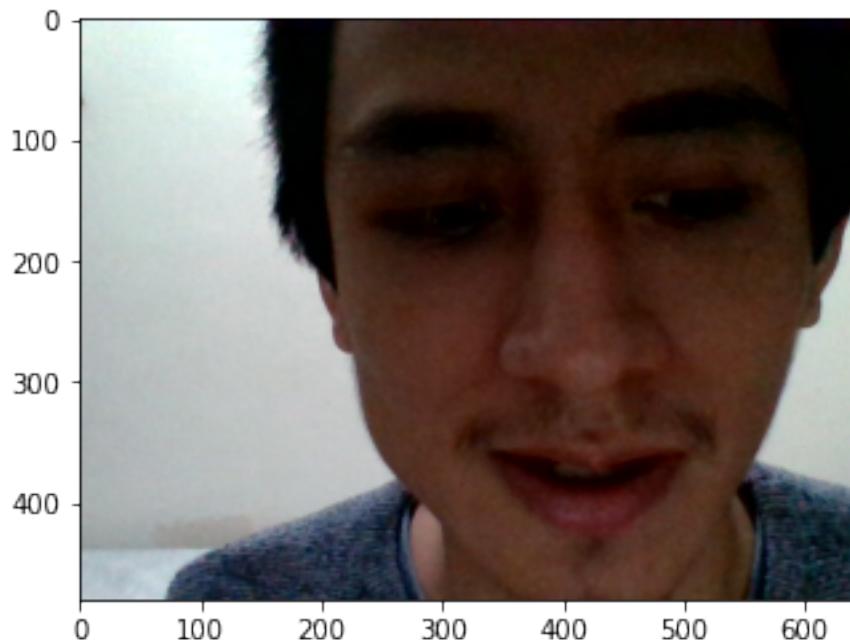
1/1 [=====] - 0s 34ms/step  
No lleva Mascarilla - P. Comunitarias



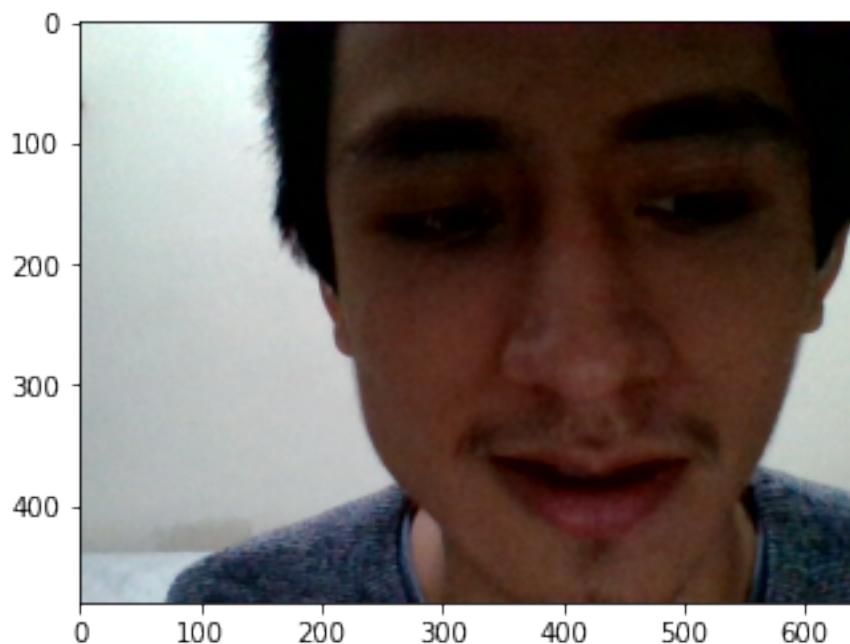
1/1 [=====] - 0s 21ms/step  
No lleva Mascarilla - P. Comunitarias



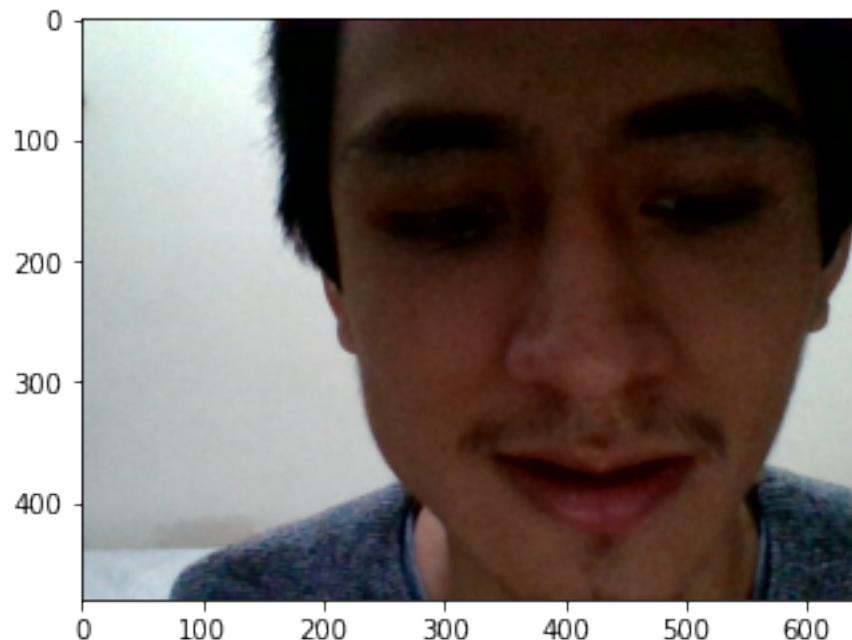
1/1 [=====] - 0s 20ms/step  
No lleva Mascarilla - P. Comunitarias



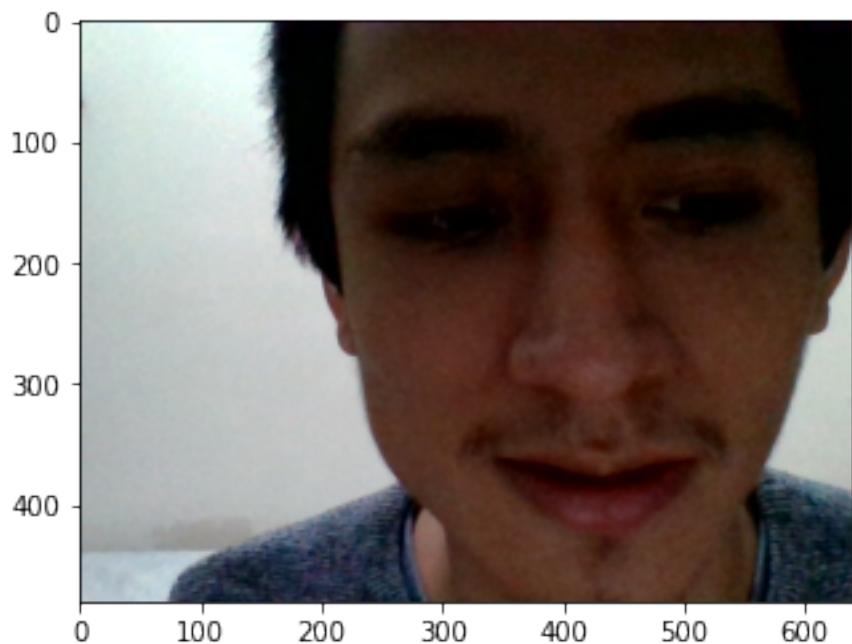
1/1 [=====] - 0s 24ms/step  
No lleva Mascarilla - P. Comunitarias



1/1 [=====] - 0s 21ms/step  
No lleva Mascarilla - P. Comunitarias

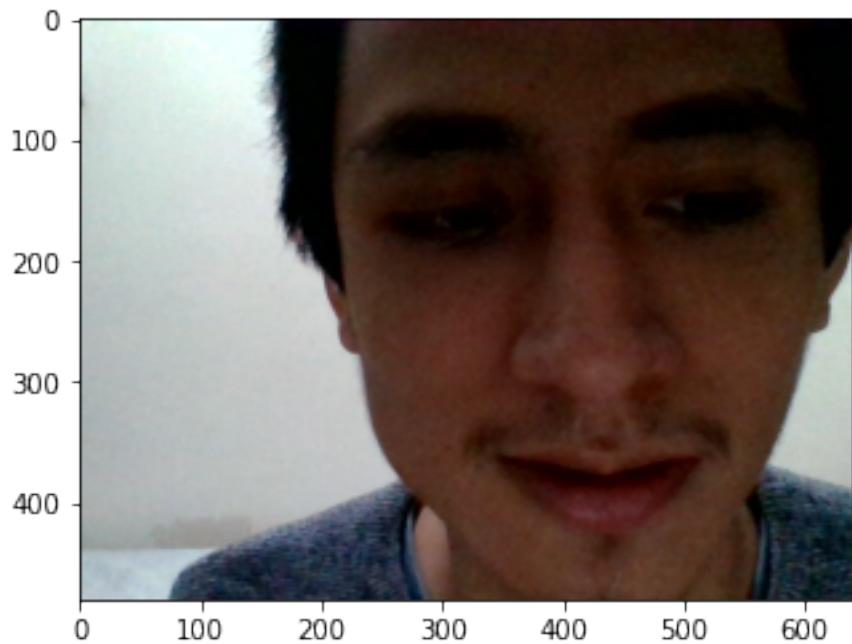


1/1 [=====] - 0s 20ms/step  
No lleva Mascarilla - P. Comunitarias



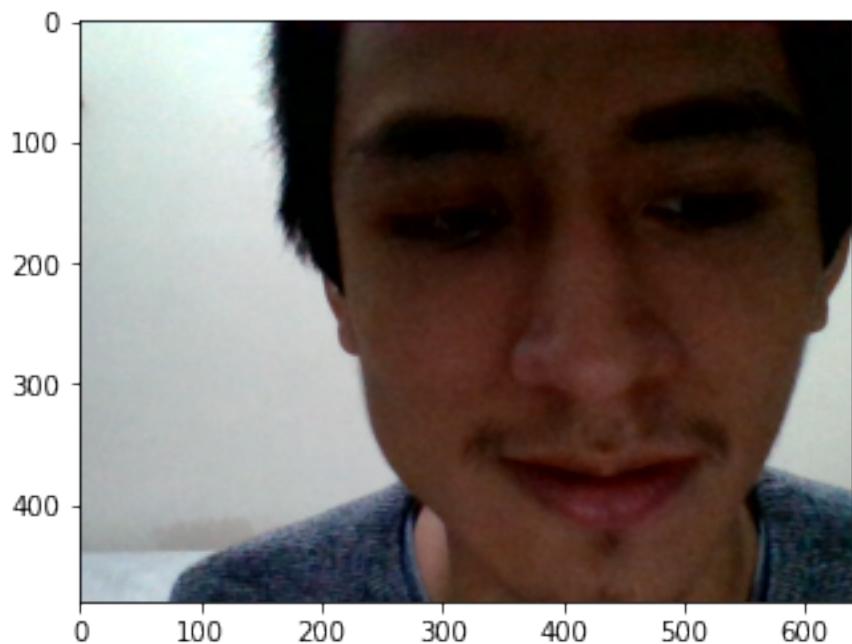
1/1 [=====] - 0s 60ms/step

No lleva Mascarilla - P. Comunitarias



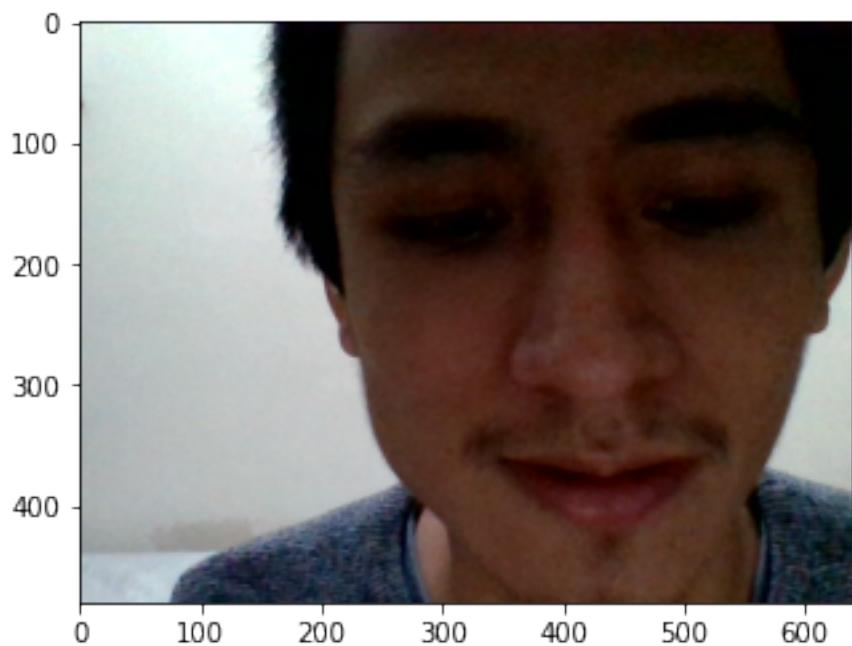
1/1 [=====] - 0s 20ms/step

No lleva Mascarilla - P. Comunitarias



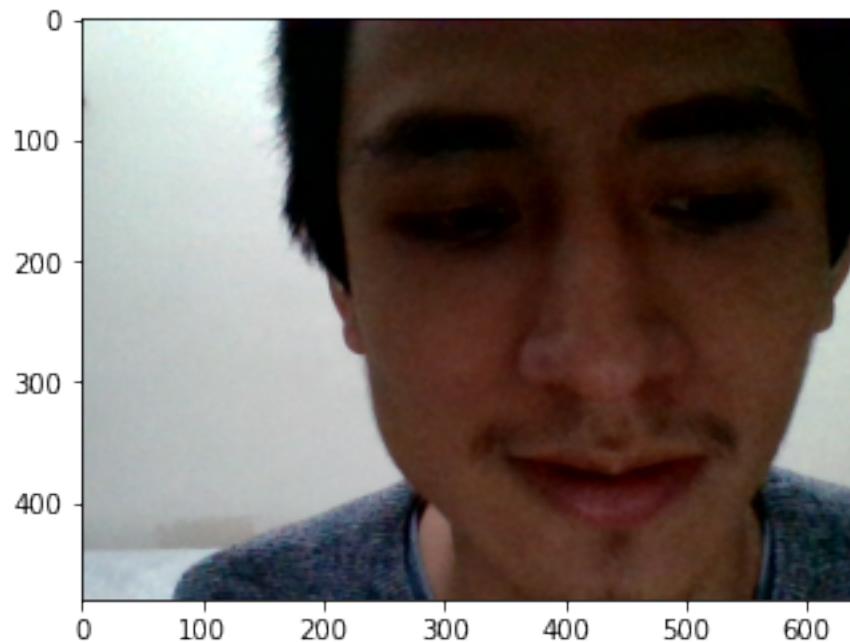
1/1 [=====] - 0s 21ms/step

No lleva Mascarilla - P. Comunitarias



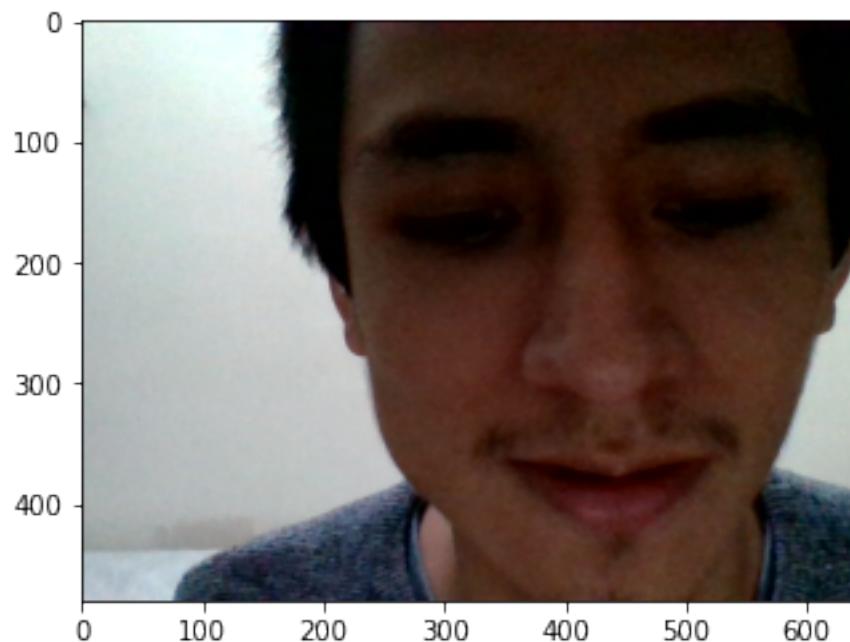
1/1 [=====] - 0s 22ms/step

No lleva Mascarilla - P. Comunitarias

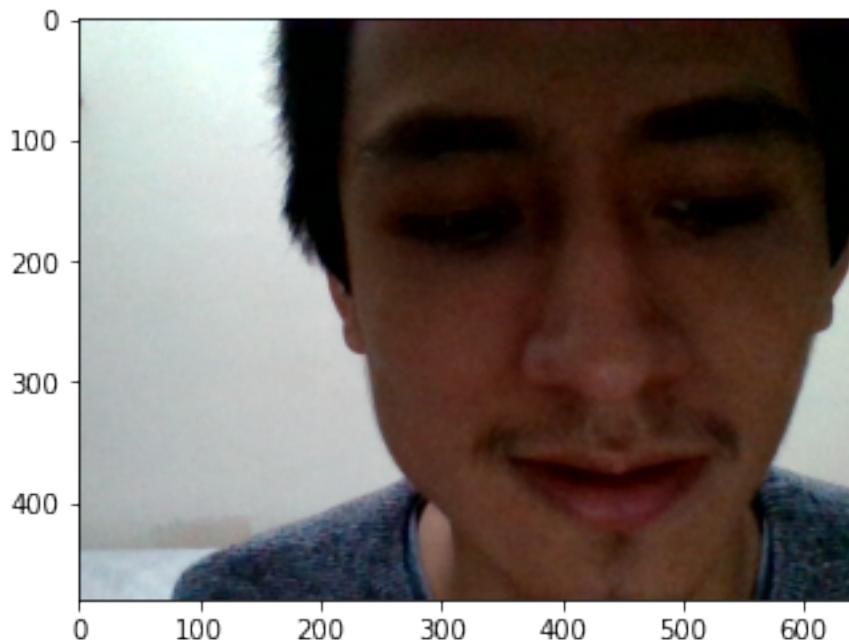


1/1 [=====] - 0s 22ms/step

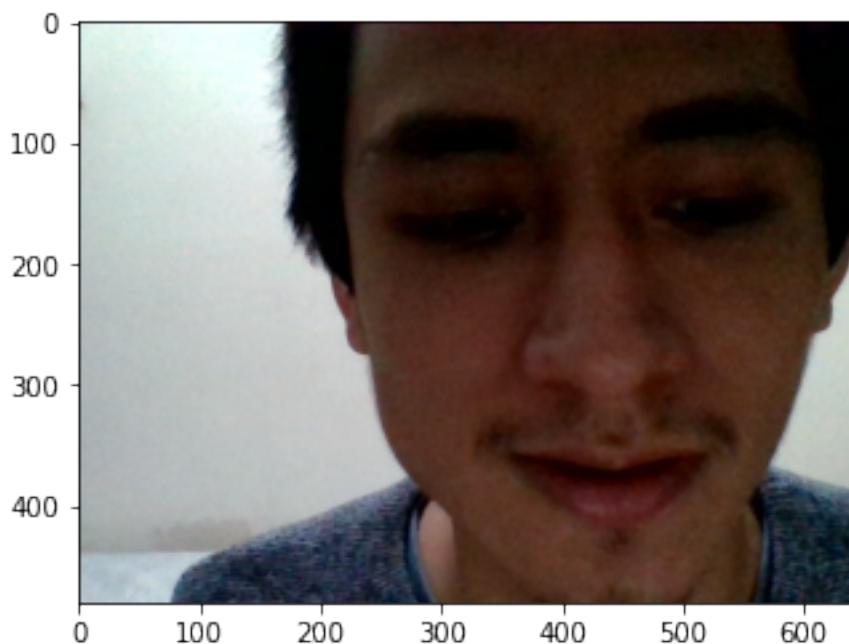
No lleva Mascarilla - P. Comunitarias



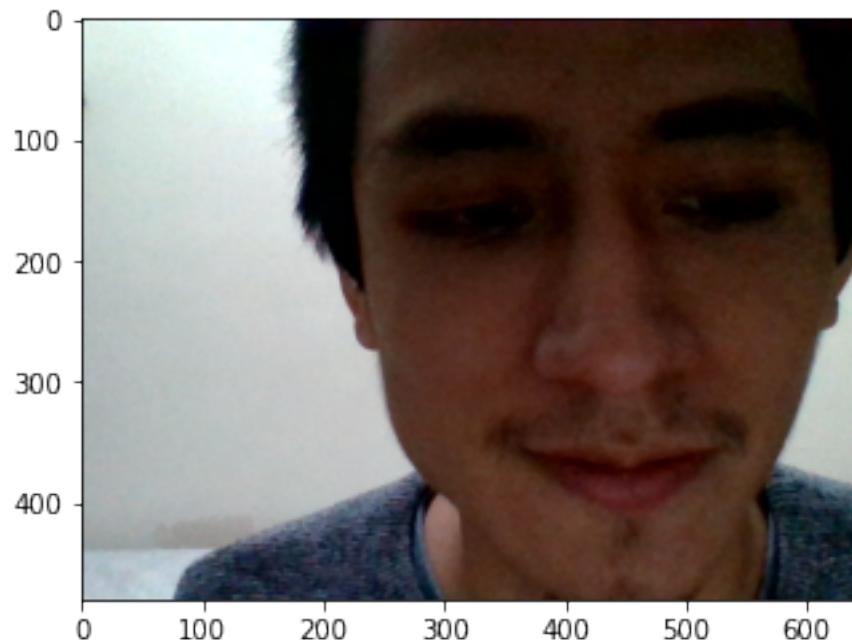
1/1 [=====] - 0s 36ms/step  
No lleva Mascarilla - P. Comunitarias



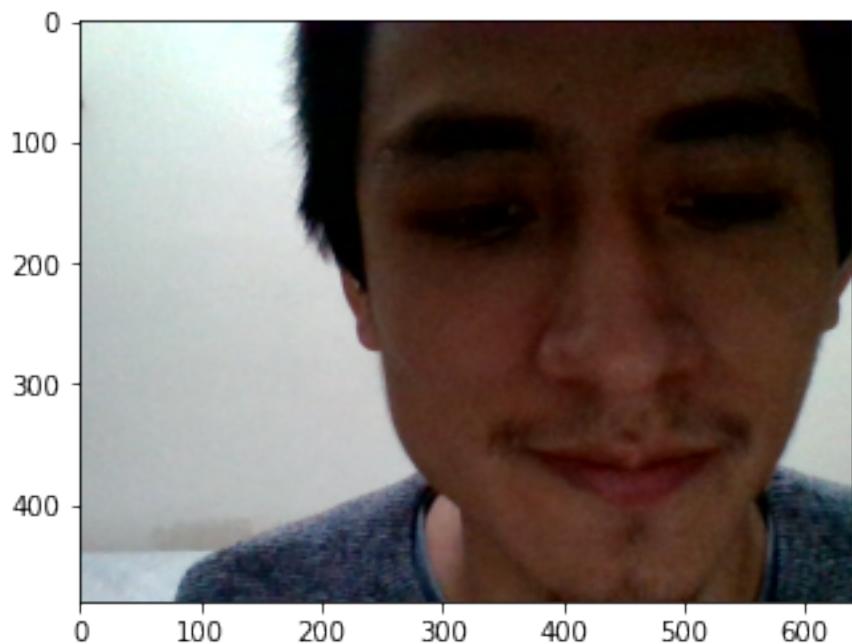
1/1 [=====] - 0s 20ms/step  
No lleva Mascarilla - P. Comunitarias



1/1 [=====] - 0s 21ms/step  
No lleva Mascarilla - P. Comunitarias

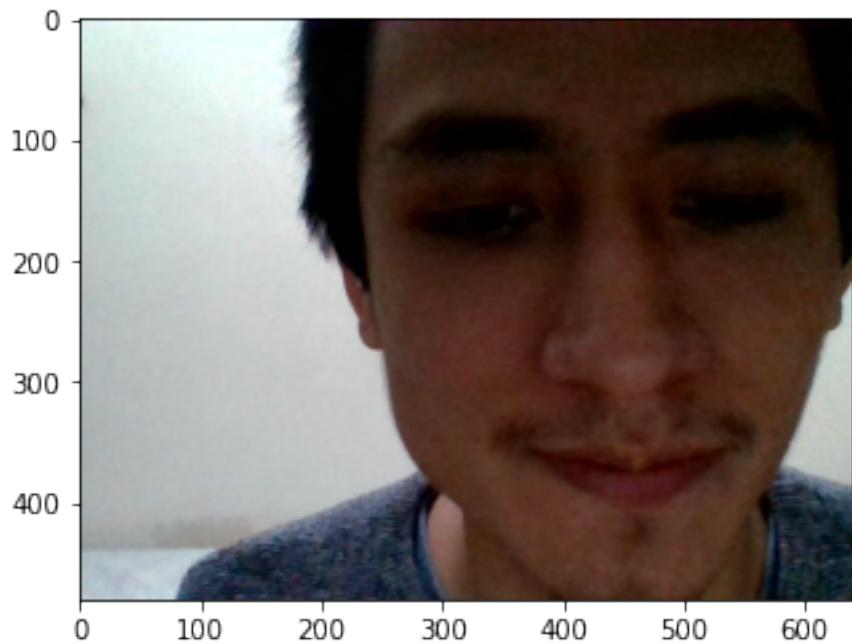


1/1 [=====] - 0s 21ms/step  
No lleva Mascarilla - P. Comunitarias



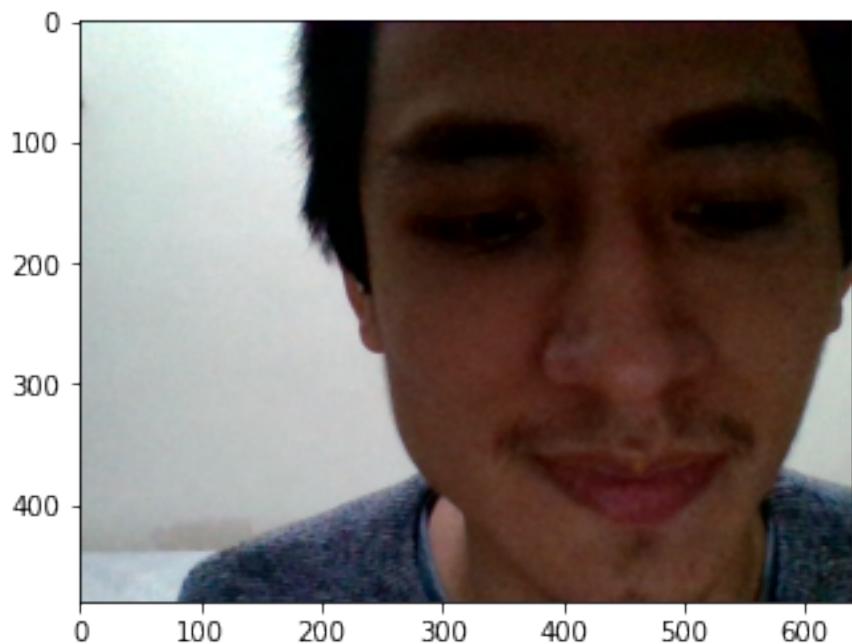
1/1 [=====] - 0s 24ms/step

No lleva Mascarilla - P. Comunitarias



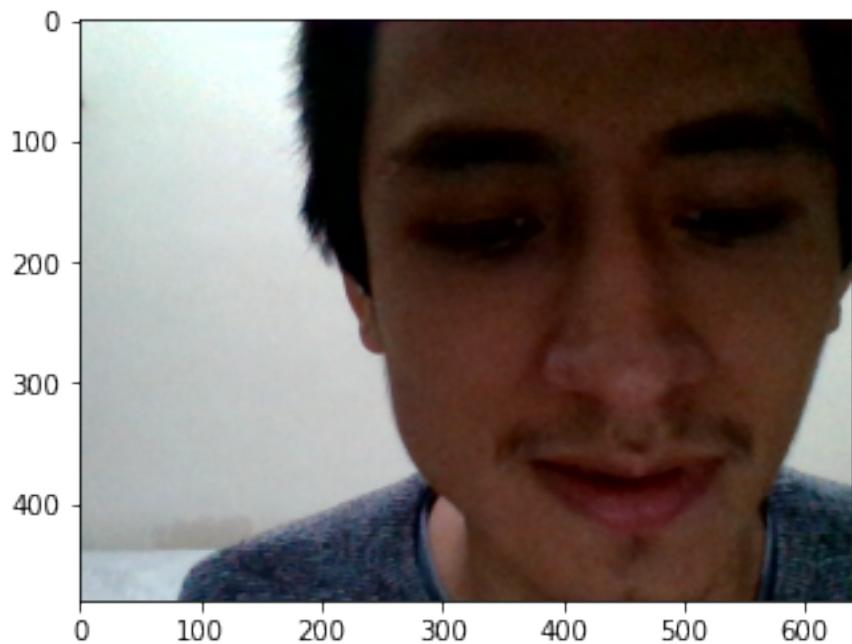
1/1 [=====] - 0s 23ms/step

No lleva Mascarilla - P. Comunitarias



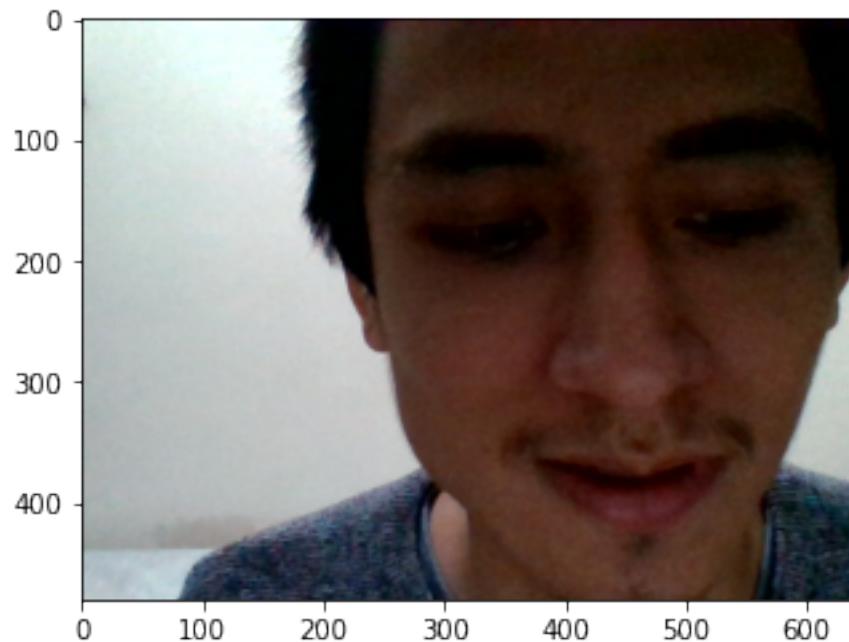
1/1 [=====] - 0s 23ms/step

No lleva Mascarilla - P. Comunitarias



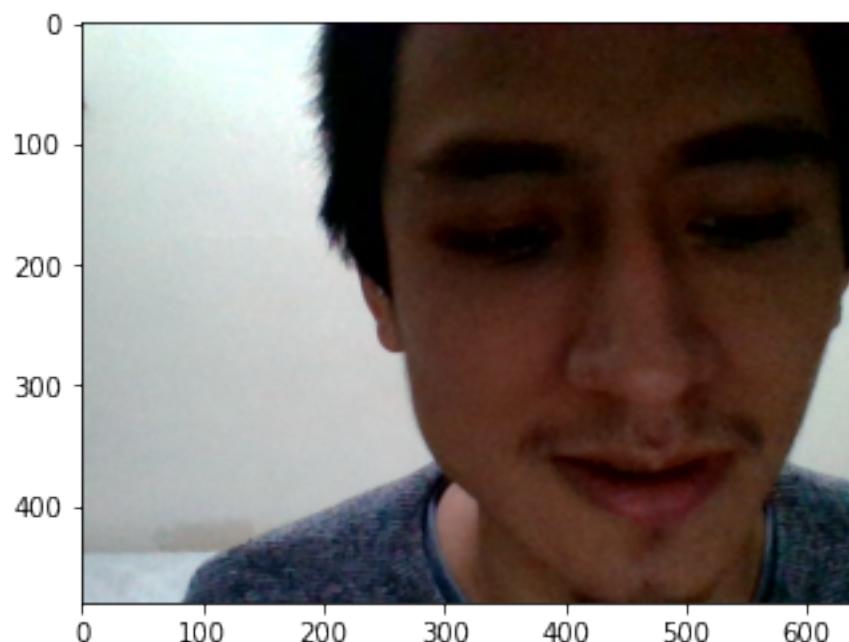
1/1 [=====] - 0s 23ms/step

No lleva Mascarilla - P. Comunitarias

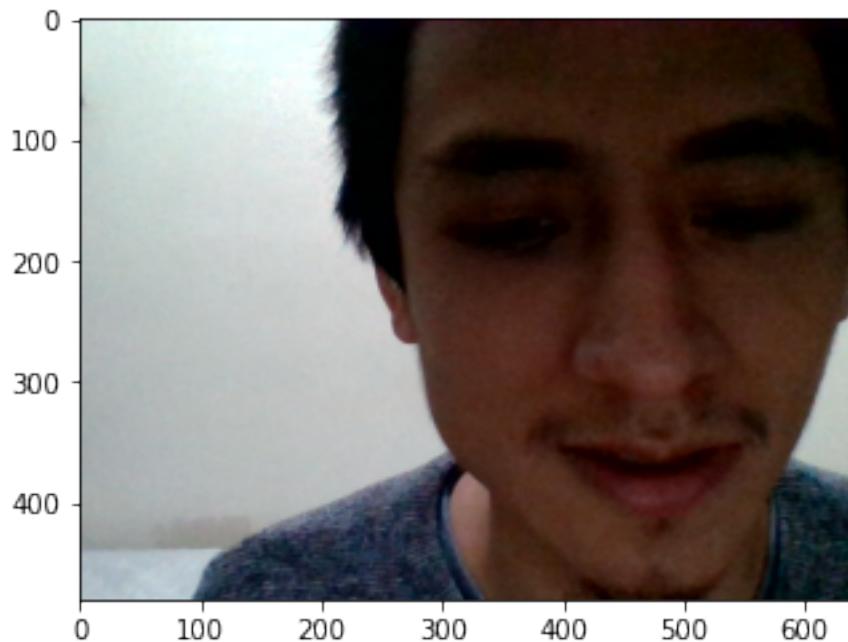


1/1 [=====] - 0s 22ms/step

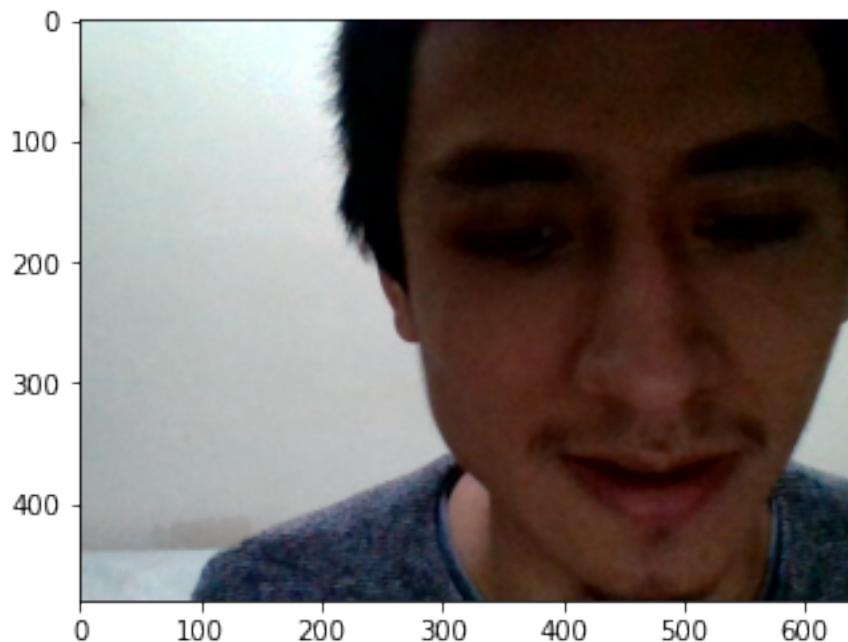
No lleva Mascarilla - P. Comunitarias



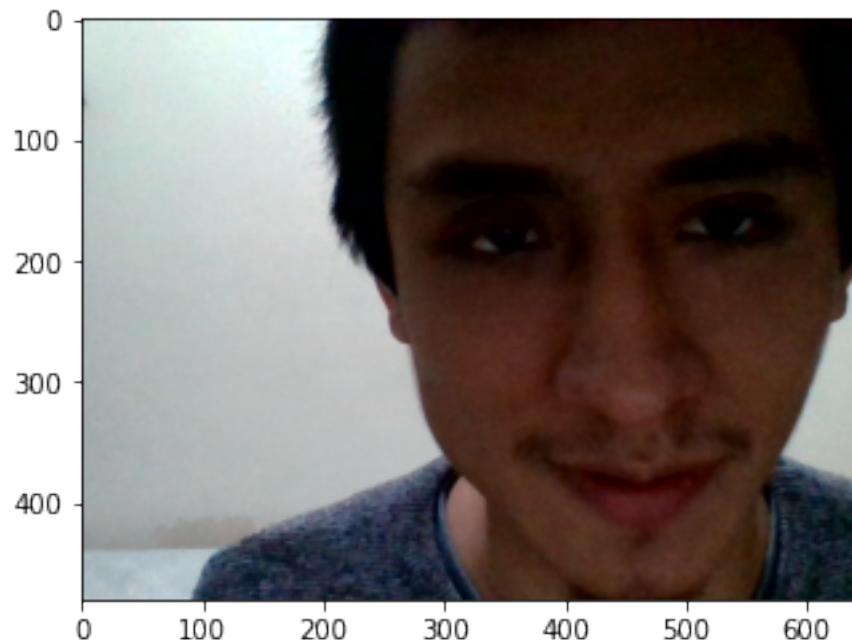
1/1 [=====] - 0s 29ms/step  
No lleva Mascarilla - P. Comunitarias



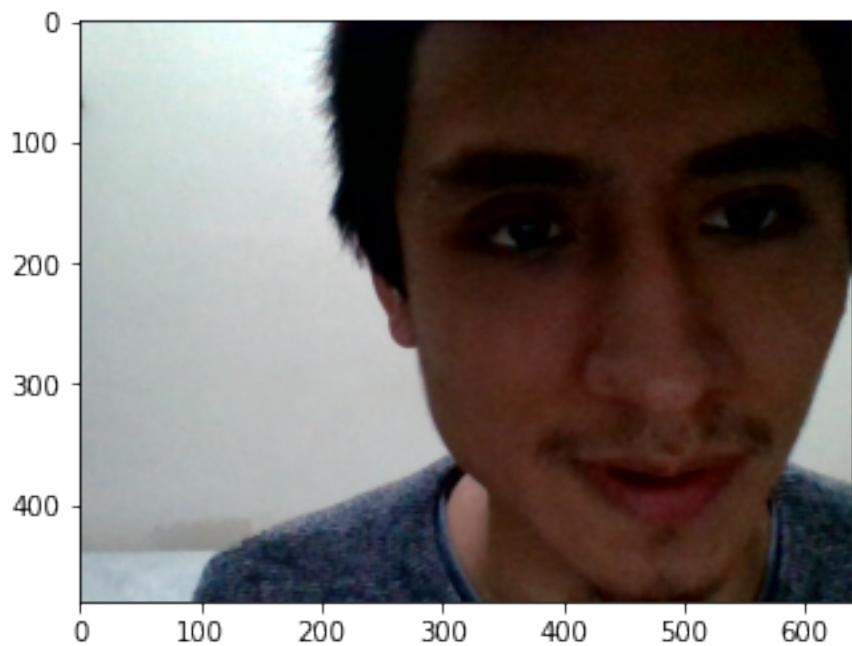
1/1 [=====] - 0s 21ms/step  
No lleva Mascarilla - P. Comunitarias



1/1 [=====] - 0s 22ms/step  
No lleva Mascarilla - P. Comunitarias

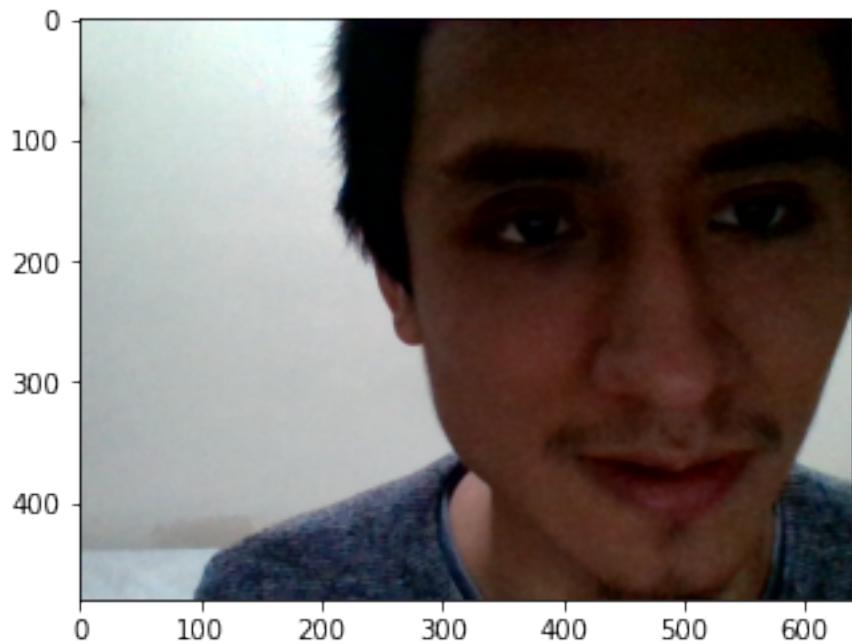


1/1 [=====] - 0s 20ms/step  
No lleva Mascarilla - P. Comunitarias



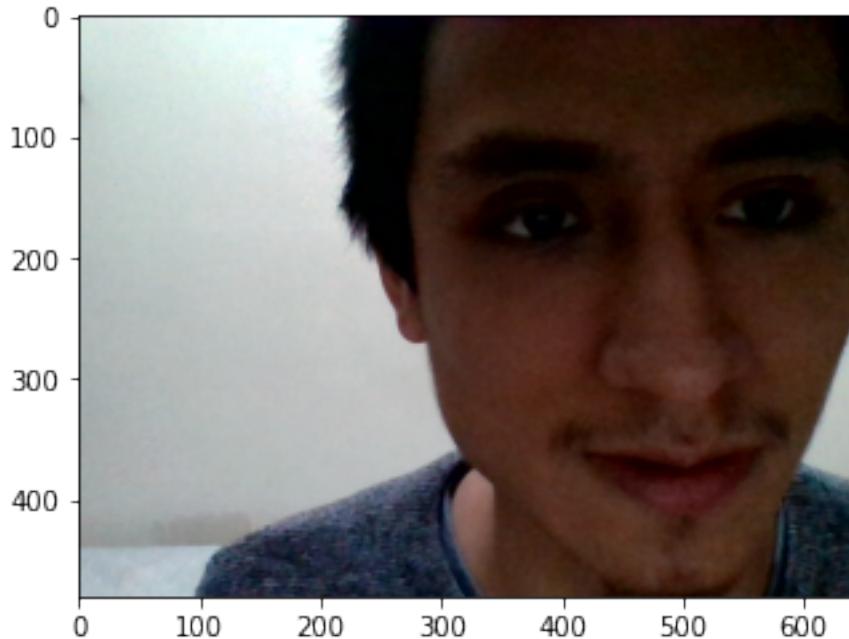
1/1 [=====] - 0s 21ms/step

No lleva Mascarilla - P. Comunitarias



1/1 [=====] - 0s 25ms/step

No lleva Mascarilla - P. Comunitarias



```
error                                         Traceback (most recent call last)
Input In [12], in <cell line: 11>()
      12 try:
      13     is_capturing, frame = vc.read()
---> 14     frame = cv2.cvtColor(frame, cv2.COLOR_BGR2RGB)
      15     frame_res = cv2.resize(frame, dsize=(150, 150), interpolation=cv2.
      ↪INTER_CUBIC) #Lee el mismo size que espera el modelo y te ahorra reshapes
      16     x=image.img_to_array(frame_res)

error: OpenCV(4.6.0) D:
  ↪\a\opencv-python\opencv-python\opencv\modules\imgproc\src\color.cpp:182: error ::
  ↪ (-215:Assertion failed) !_src.empty() in function 'cv::cvtColor'
```

```
[ ]: converter = tf.lite.TFLiteConverter.from_keras_model(model)
      tflite_model = converter.convert()
```

```
[ ]: open("mask_classifier.tflite","wb").write(tflite_model)
```