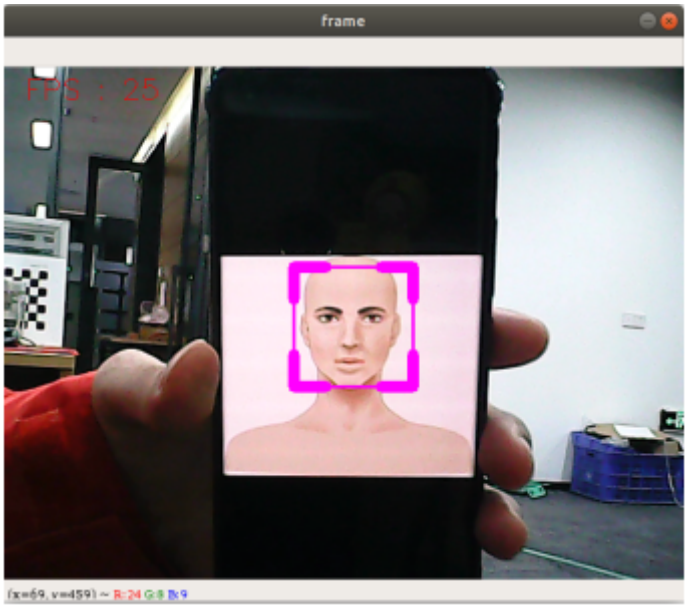
5.Face recognition

Note: Due to differences in motherboard performance, running this function may not be as smooth.
If we encounter a stuck situation, we can remove the camera, plug it into the virtual machine, and connect the camera device in the virtual machine to run the corresponding program on the virtual machine

1) Start

Input following command:

```
roscore
rosrun yahboomcar_mediapipe 05_FaceEyeDetection.py
```



2) Code

Code path:
/home/yahboom/orbbec_ws/src/yahboomcar_mediapipe/scripts/05_FaceEyeDetection.py

```
#!/usr/bin/env python3
# encoding: utf-8
import time
import rospy
import rospkg
import cv2 as cv
from cv_bridge import CvBridge
from sensor_msgs.msg import CompressedImage, Image


class FaceEyeDetection:
    def __init__(self):
        self.bridge = CvBridge()
        rospy.on_shutdown(self.cancel)
        rospy.init_node("FaceEyeDetection", anonymous=False)
```

```
        self.eyeDetect = cv.CascadeClassifier(
            rospkg.RosPack().get_path("yahboomcar_mediapipe") +
"/scripts/file/haarcascade_eye.xml")
        self.faceDetect = cv.CascadeClassifier(
            rospkg.RosPack().get_path("yahboomcar_mediapipe") +
"/scripts/file/haarcascade_frontalface_default.xml")
        self.pub_rgb = rospy.Publisher("/FaceEyeDetection/image", Image,
queue_size=1)

    def cancel(self):
        self.pub_rgb.unregister()

    def face(self, frame):
        gray = cv.cvtColor(frame, cv.COLOR_BGR2GRAY)
        faces = self.faceDetect.detectMultiScale(gray, 1.3)
        for face in faces: frame = self.faceDraw(frame, face)
        return frame

    def eye(self, frame):
        gray = cv.cvtColor(frame, cv.COLOR_BGR2GRAY)
        eyes = self.eyeDetect.detectMultiScale(gray, 1.3)
        for eye in eyes:
            cv.circle(frame, (int(eye[0] + eye[2] / 2), int(eye[1] + eye[3] /
2)), (int(eye[3] / 2)), (0, 0, 255), 2)
        return frame

    def faceDraw(self, frame, bbox, l=30, t=10):
        x, y, w, h = bbox
        x1, y1 = x + w, y + h
        cv.rectangle(frame, (x, y), (x + w, y + h), (255, 0, 255), 2)
        # Top left x,y
        cv.line(frame, (x, y), (x + l, y), (255, 0, 255), t)
        cv.line(frame, (x, y), (x, y + l), (255, 0, 255), t)
        # Top right x1,y
        cv.line(frame, (x1, y), (x1 - l, y), (255, 0, 255), t)
        cv.line(frame, (x1, y), (x1, y + l), (255, 0, 255), t)
        # Bottom left x1,y1
        cv.line(frame, (x, y1), (x + l, y1), (255, 0, 255), t)
        cv.line(frame, (x, y1), (x, y1 - l), (255, 0, 255), t)
        # Bottom right x1,y1
        cv.line(frame, (x1, y1), (x1 - l, y1), (255, 0, 255), t)
        cv.line(frame, (x1, y1), (x1, y1 - l), (255, 0, 255), t)
        return frame

    def pub_img(self, frame):
        self.pub_rgb.publish(self.bridge.cv2_to_imgmsg(frame, "bgr8"))


if __name__ == '__main__':
    capture = cv.VideoCapture(0)
    capture.set(6, cv.VideoWriter_fourcc(*'XVID'))
    capture.set(cv.CAP_PROP_FRAME_WIDTH, 640)
    capture.set(cv.CAP_PROP_FRAME_HEIGHT, 480)
    print("capture get FPS : ", capture.get(cv.CAP_PROP_FPS))
    pTime, cTime, content_index = 0, 0, 0
```

```
    dat_file = "./file/shape_predictor_68_face_landmarks.dat"
    face_eye_detection = FaceEyeDetection()
    content = ["face", "eye", "face_eye"]
    while capture.isOpened():
        ret, frame = capture.read()
        # frame = cv.flip(frame, 1)
        action = cv.waitKey(1) & 0xFF
        if action == ord("f") or action == ord("F"):
            content_index += 1
            if content_index >= len(content): content_index = 0
        if content[content_index] == "face": frame =
face_eye_detection.face(frame)
        elif content[content_index] == "eye": frame =
face_eye_detection.eye(frame)
        else: frame = face_eye_detection.eye(face_eye_detection.face(frame))
        if action == ord('q') or action == ord("Q"): break
        cTime = time.time()
        fps = 1 / (cTime - pTime)
        pTime = cTime
        text = "FPS : " + str(int(fps))
        cv.putText(frame, text, (20, 30), cv.FONT_HERSHEY_SIMPLEX, 0.9, (0, 0,
255), 1)
        cv.imshow('frame', frame)
        face_eye_detection.pub_img(frame)
    capture.release()
    cv.destroyAllWindows()
```