第四次作业

一、主要功能

获取摄像头视频输入，读取帧数据，人脸检测，框出人脸与眼睛。

二、代码实现

import cv2 as cv

import os

PATH = os.path.split(cv.\_\_file\_\_)[0] + os.sep + "data" + os.sep

# 实时人脸检测

def face\_detect():

    capture = cv.VideoCapture(0)

    while(True):

        ret, frame = capture.read()

        # 转换为灰度图像

        gray = cv.cvtColor(frame, cv.COLOR\_BGR2GRAY)

        # 调用人脸检测器

        face\_detector = cv.CascadeClassifier(PATH + "haarcascade\_frontalface\_default.xml")

        # 检测人脸

        faces = face\_detector.detectMultiScale(gray, 1.02, 5)

        # 绘制人脸

        for x, y, w, h in faces:

            cv.rectangle(frame, (x, y), (x+w, y+h), (0, 0, 255), 2)

            # 调用眼部检测器

            eye\_detector = cv.CascadeClassifier(PATH + "haarcascade\_eye.xml")

            # 检测眼部

            eyes = eye\_detector.detectMultiScale(gray, 1.2, 5)

            # 绘制眼部

            for x, y, w, h in eyes:

                cv.rectangle(frame, (x, y), (x+w, y+h), (0, 255, 0), 2)

        # 显示图像

        cv.imshow("video", frame)

        # 按下q退出

        if cv.waitKey(1) == ord('q'):

            break

# 视频人脸检测

def face\_detect\_video(video\_path):

    capture = cv.VideoCapture(video\_path)

    face\_detector = cv.CascadeClassifier(PATH + "haarcascade\_frontalface\_default.xml")

    eye\_detector = cv.CascadeClassifier(PATH + "haarcascade\_eye.xml")

    # 循环读取视频帧

    while True:

        ret, frame = capture.read()

        if ret is True:

            gray = cv.cvtColor(frame, cv.COLOR\_BGR2GRAY)

            faces = face\_detector.detectMultiScale(gray, 1.3, 5)

            for x, y, w, h in faces:

                cv.rectangle(frame, (x, y), (x+w, y+h), (0, 0, 255), 2)

                eyes = eye\_detector.detectMultiScale(gray, 1.2, 5)

                for x, y, w, h in eyes:

                    cv.rectangle(frame, (x, y), (x+w, y+h), (0, 255, 0), 2)

            cv.imshow("result", frame)

            if cv.waitKey(1) == ord('q'):

                break

        else:

            break

capture.release()

# 视频人脸检测

def face\_detect\_video(video\_path):

    capture = cv.VideoCapture(video\_path)

    face\_detector = cv.CascadeClassifier(PATH + "haarcascade\_frontalface\_default.xml")

    eye\_detector = cv.CascadeClassifier(PATH + "haarcascade\_eye.xml")

    # 循环读取视频帧

    while True:

        ret, frame = capture.read()

        if ret is True:

            gray = cv.cvtColor(frame, cv.COLOR\_BGR2GRAY)

            faces = face\_detector.detectMultiScale(gray, 1.3, 5)

            for x, y, w, h in faces:

                cv.rectangle(frame, (x, y), (x+w, y+h), (0, 0, 255), 2)

                eyes = eye\_detector.detectMultiScale(gray, 1.2, 5)

                for x, y, w, h in eyes:

                    cv.rectangle(frame, (x, y), (x+w, y+h), (0, 255, 0), 2)

            cv.imshow("result", frame)

            if cv.waitKey(1) == ord('q'):

                break

        else:

            break

    capture.release()

if \_\_name\_\_ == '\_\_main\_\_':

    face\_detect()

    cv.destroyAllWindows()

三、运行结果

