**FRUIT RIPENESS DETECTION**

camera=cv2.VideoCapture(0)

return\_value, image=camera.read()

cv2.imwrite(i+’.jpeg’, image)

del(camera)

fram= image

edge\_img = deepcopy(image)

edged= cv2.Canny(edge\_img, 50, 100)

edged =cv2.dilate (edged, None, iterations=1)

edged= cv2.erode(edged, None, iterations=1)

cnts, h =cv2.findContours (edged.copy(), cv2.RETR\_EXTERNAL, cv2.CHAIN\_APPROX\_SIMPLE)

max\_cont= max(cnts, key=cv2.contourArea)

x, y, w, h=cv2.boundingRect(max\_cont)

hsv =cv2.cvtColor(frame, cv2.COLOR\_BGR2HSV)

lower\_red =np.array([0, 50, 50])

upper\_red =np.array([10, 255, 255))

redmask1=cv2.inRange (hsv, lower\_red, upper\_red)

lower\_red=np.array([170, 50, 50])

upper\_red=np.array([180, 255, 255])

redmask2=cv2.inRange (hsv, lower\_red, upper\_red)

redmask=redmask1+redmask2

maskopen=cv2.morphologyEx(redmask, cv2.MORPH\_OPEN, kernelOpen)

maskClose=cv2.morphologyEx(maskOpen, cv2.MORPH\_CLOSE, kernelClose)

maskFinal=maskClose

cv2.imshow('Red\_Mask:', maskFinal)

cnt\_r,\_=cv2.findContours (maskFinal, cv2.RETR\_EXTERNAL, cv2.CHAIN\_APPROX\_SIMPLE )

cnt\_r\_area=sum(cv2.contourArea(c) for c in cnt\_r)

lower\_green=np.array([50, 50, 50])

upper\_green=np.array([70, 255, 255))

greenmask=cv2.inRange(hsv, lower\_green, upper\_green)

cv2.imshow("Green Mask:', greenmask)

cnt\_g=cv2.countNonZero(greenmask)

print("Greenness", cnt\_g)

lower\_yellow=np.array([20, 50, 50])

upper\_yellow=np.array([50, 255, 255))

yellowmask=cv2.inRange (hsv, lower\_yellow, upper\_yellow)

cv2.imshow(‘Yellow Mask:’, yellowmask)

cnt\_y=cv2.countNonZero (yellowmask)

print("Yellowness", cnt\_y)

tot\_area=cnt\_r\_area+cnt\_y+ cnt\_g

rperc=cnt\_r\_area / tot\_area

yperc=cnt\_y / tot\_area

gperc=cnt\_g/ tot\_area

glimit= 0.1

if yperc\*100<10 or gperc\*100<10:

print("Fruit not detected")

else:

if gperc > glimit:

print(f"Unripe({gperc\*100:.2f}%Unripe)")

else:

print(f"Ripe({yperc\*100:.2f}%ripe)")