videorecencdecyuvkey

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1 Videorecencdecyuvkey

Program to capture a video from a camera, transform it to YUV, transform it back, and display it live on the screen

- Gerald Schuller,November 2015

- **Import the relevant modules:**

```
In [1]: import numpy as np
        import cv2

        cap = cv2.VideoCapture(0)

        Yon=True
        Uon=True
        Von=True
```

- **Start capturing, transform to Y, U, V components by encoding and display them back simultaneously by decoding: One can toggle the transformed components by pressing the following keys:**
  - **Toggle Luminance component Y - press 'y'**
  - **Toggle Chrominance component U - press 'u'**
  - **Toggle Chrominance component V - press 'v'**
- **Press 'q' to quit the open windows**

```
In [2]: while(True):
            # Capture frame-by-frame
            [ret, frame] = cap.read()
            framerec = np.zeros(frame.shape)

            # Display the original frame
            cv2.imshow('Original',frame)

            # Our operations on the frames come here
            ######Encoder#############################
```

```
#Forwaerts Farb-Transformation im Encoder:
#Berechnung der Luminanz-Komponente Y und der Farb-Komponenten U und V:
# Y= 0.114*B+0.587*G+0.299*R :
# /256 because the result is float values which imshow expects in range 0...1:
Y = (0.114 * frame[:,:,0] + 0.587 * frame[:,:,1] + 0.299 * frame[:,:,2])/255

#U=B-Y:
U = frame[:,:,0]/255.0-Y

#V=R-Y:
V = frame[:,:,2]/255.0-Y

####################Decoder ################

#Inverse Farb-Transformation im Decoder:

if Yon == False:
    #Probeweise nur Farbkomponenten durch setzen von den Y-Komponenten auf einen fes
    Y = np.ones(Y.shape)*0.5

#Probeweise Null setzen von Farb-Komponenten:
if Uon == False:
    U = np.zeros(U.shape)
if Von == False:
    V = np.zeros(V.shape)

B = U + Y
R = V + Y
G = (Y - 0.114*B - 0.299*R)/0.587
#Schreibe die RGB Komponenten in den rekonstruierten Frame:
framerec[:,:,0] = B
framerec[:,:,1] = G
framerec[:,:,2] = R

#Display reconstructed video
#Display text with
#putText(frame, text string, position, fontFace, fontScale, color, thickness)
cv2.putText(framerec,"Key y: Y comp. on/off, Y on="+str(Yon), (20,50), cv2.FONT_HERS
cv2.putText(framerec,"Key u: U comp. on/off, U on="+str(Uon), (20,100), cv2.FONT_HER
cv2.putText(framerec,"Key v: V comp. on/off, V on="+str(Von), (20,150), cv2.FONT_HER

cv2.imshow('Reconstructed, exit with q',framerec)

key=cv2.waitKey(1) & 0xFF
if key == ord('y'):
    Yon = not Yon
if key == ord('u'):
    Uon = not Uon
```

```
    if key == ord('v'):
        Von = not Von
    #Ende durch Taste "q":
    if key == ord('q'):
        break

# When everything done, release the capture
cap.release()
cv2.destroyAllWindows()
```