Recognize Uno Card using Python and OpenCV

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Dataset

```
def loadImg(path):
  data = {i.split("blue_")[1][0]:cv2.imread(i,cv2.IMREAD_GRAYSCALE) for i in glob.glob(path+'blue_*.jpg')}
  return data
```

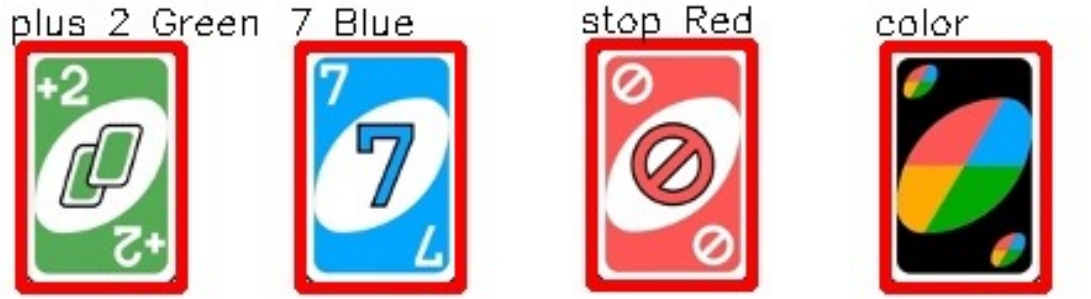
```
def isColor(pixel):
  if (pixel[0]<10 or 175≤pixel[0]) and 25≤pixel[1] and 25≤pixel[2]:
    return 'Red'
  elif 20≤pixel[0]<35 and 25≤pixel[1] and 25≤pixel[2]:
    return 'Yellow'
  elif 35≤pixel[0]<90 and 25≤pixel[1]≤240 and 25≤pixel[2]:
    return 'Green'
  elif 90≤pixel[0]<130 and 25≤pixel[1] and 25≤pixel[2]:
    return 'Blue'
  else:
    return ''
```

```python
def findCard(img,tpl,text):
  card = {'s':'stop','p':'plus 2','r':'revert','c':'color','w':'plus 4'}
  if not (text ≥ '0' and text ≤ '9'):
    text = card[text]
  img_gray = cv2.cvtColor(img, cv2.COLOR_BGR2GRAY)

  (ih,iw) = img_gray.shape[:2]
  (th,tw) = tpl.shape[:2]

  location = {}
  for scale in np.linspace(0.1, 4.0, 100)[::-1]:
    w = int(tw*scale)
    h = int(th*scale)
    resized = cv2.resize(tpl, (w,h))
    if resized.shape[0] > ih or resized.shape[1] > iw or resized.shape[0] < 5 or resized.shape[1] < 5:
      continue

    result = cv2.matchTemplate(img_gray, resized, cv2.TM_CCOEFF_NORMED)
    threshold = 0.86
    (ys,xs) = np.where(result ≥ threshold)
    rects = []
    for (x,y) in zip(xs,ys):
      rects.append((x, y, x+w, y+h))

    picks = non_max_suppression(np.array(rects))
    for (x1, y1, x2, y2) in picks:
      tmp = img[y1:y2,x1:x2]
      w = int((x2-x1)/2)
      h = int((y2-y1)/8)
      color = isColor(cv2.cvtColor(tmp, cv2.COLOR_BGR2HSV)[w,h])
      location[x1] = "{} {}".format(text,color)
      cv2.rectangle(img, (x1,y1), (x2, y2), (0,0,255), 3)
      cv2.putText(img, "{} {}".format(text,color), (x1-5, y1-5), cv2.FONT_HERSHEY_SIMPLEX, 0.5, (0, 0, 0), 1)
  return img,location
```

```python
def main(data,img):
  location = {}
  for i in data:
    img,loc = findCard(img,data[i],i)
    for j in loc:
      location[j] = loc[j]
  sortLoc = [location[i] for i in sorted(location)]
  print(sortLoc)
  # return img
  cv2.imshow("Image", img)
  cv2.waitKey(0)
  cv2.destroyAllWindows()
```

Data test

Result



youtube: https://youtu.be/snctEAEspm4

github: https://github.com/gritsp/recognize-unocard-python