**Report of Homework1: Primitive Panorama Stitching**

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For homework1, I chose the second problem, primitive panorama stitching. In my project, I mainly took advantage of OpenCV as the tool to process and analyze the pictures. NumPy and matplotlib as utilized to process some data and show pictures, respectively. To run this code, you should read the README file. Following is the pseudocode (This is my first time to write pseudocode…).

**Original Pictures:**

卡车行驶在路上

描述已自动生成路上有许多树

描述已自动生成

**Pseudocode:**

*pic1, pic2 = cv.imread(pictures) # load two images*

*cv.copyMakeBorder(pic1, pic2) # extend the border of two loaded images*

*cv.cvtColor(pic1, pic2) # convert color to gray*

*cv.xfeatures2d\_SIFT().create()*

*sift.detectAndCompute(gray) # find key points and descriptors of two pictures*

*# flann parameters*

*FLANN\_INDEX\_KDTREE = 1*

*flann = cv.FlannBasedMatcher(index\_params, search\_params)*

*matches = flann.knnMatch(d1, d2, k=2)*

*# draw matches of the two pictures*

*FOR m, n IN matches:*

*IF m.distance < 0.7 \* n.distance:*

*ADD m TO the match\_masks*

*img3 = cv.drawMatchesKnn()*

*SHOW and SAVE img3*

*# stitch two pictures*

*rows, cols = img1\_1.shape[:2] # set the rows and columns of the final result*

*ADD key points TO img1\_pts AND img2\_pts*

*M, mask = cv.findHomography(img1\_pts, img2\_pts, cv.RANSAC)*

*warp\_img = cv.warpPerspective*

*res = np.zeros([rows, cols, 3], np.uint8) # set the result matrix for final picture*

*FOR row IN rows:*

*FOR col IN cols:*

*IF NOT img1\_1[row, col].any():*

*res[row, col] = warp\_img[row, col]*

*ELIF NOT warp\_img[row, col].any():*

*res[row, col] = img1\_1[row, col]*

*ELSE:*

*img1\_len = float(abs(col - left))*

*img2\_len = float(abs(col - right))*

*alpha = img1\_len / (img1\_len + img2\_len)*

*res[row, col] = np.clip(img1\_1[row, col] \* (1 - alpha) +warp\_img[row, col] \* alpha, 0, 255)*

*res = cv.cvtColor(res, cv.COLOR\_BGR2RGB) # convert color to RGB*

*SHOW and SAVE final picture*

**Results:**

图片包含 游戏机, 树

描述已自动生成路旁有许多树

描述已自动生成