NTUST course: Computer Vision and Applications (CI5336701, 2017 Spring)

Homework#2：Using homography mapping to inpaint an image, and convert it into front view

Date Due：2017. Apr. 7th, PM11:55。

Description

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1. Writing a program for reading JPG/BMP images, calculating homography mapping matrixes between them, and inpainting the obstacle region of the image, then convert it into a front-view image. (choose your tools, ex. C++/C, openCV, Matlab).
   請撰寫程式讀取圖檔，計算 homography，修補遮蔽照片的區塊，並存成另一張照片。(使用您擅長的工具,可用 C/C++, OpenCV, Matlab)
2. There are two images given in this assignment, says “1.JPG” and “2.JPG”. Please manually pickup at least 4 corresponding coordinates on both images by using any Image Viewer Tool, such as Photoshop. Store these correspondences, then, compute their homography matrix. Hint: all points on this projection-screen are co-planar.
   此次作業有兩張照片(“1.JPG”和“2.JPG”)，請手動點選至少 4 組對應點，記下來寫到您的資料結構中，然後計算他們的 homography。假設投影幕牆面的所有點都在同一平面上。
3. Please manually define the pixel-region of the obstacle, as a mask. Then draw the regions by the pixels from other view according to homography transformation. Finally convert it into front view image.
   請自行手動用其他軟體描繪定義障礙物區域，如同一塊遮罩以便您的程式判讀。利用這兩張照片的 homography 關係，填補其中一張照片的遮蔽物區域。最後再將該平面轉成正面。
4. After you create the new image, please save it as another file name (named student ID).
   當你計算完照片，將遮蔽物件移除後，請將影像另外儲存成一張照片(用學號當名稱)。
5. In this homework, you can use least-square method, DLT (SVD), openCV function (ex , findHomography), Matlab (all are revealed in class) or any other ALGORITHM to archive this purpose. Note: please do NOT directly use any commercial software for this assignment.
   你可使用上課講的方法，或任何可達到此目的之演算法，但請不要直些使用商用軟體達到該目的。
6. Please write an ONE-page document for describing how and why you select these correspondences in short. Draw a mark for each feature which you have selected in 1.JPG image, and inset this image with marks in the ONE-page document for assisting your statement.
   撰寫一頁簡易說明文件，說明您如何與為何選擇這些點。並請將特徵點標示在 1.JPG，並標示後的畫面插入一頁文件中，以便於呈現與說明。
7. Deliverable: There are three types of data you should provide: 1) Source code in C++/C or Matlab, with simple comment. 2) Execution file (.exe) for this example. 3) One page description saved in ppt, doc, or pdf file format. Please zip all your files, then, upload on moodle by due 4/7

PM11:55.

請繳交 3 種檔案 1)程式原始檔，並在內文加簡易註解，2)執行檔，該執行檔可執行老師提供的檔案，3)一頁簡易說明(以 ppt, doc 或 pdf 儲存)。請將所檔案壓縮，並在期限內 4/7 晚上 PM11:55 前傳到 moodle。

Hint: the snapshot of images in this assignment:

The ground truth:

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