

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

Midterm Project: Rectify given stereo pair

Date Due : 2017. May. 7<sup>th</sup>, PM11:55 。

#### Description

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1. Writing a program for rectifying the stereo-pair. You need to estimate the fundamental matrix and homography transformation for each image, then store the corrected(rectified) images. (choose your tools, ex. C++/C, openCV, Matlab).

請撰寫程式讀取圖檔，並將立體照片矯正(Rectify)。你需要計算基礎矩陣及兩張照片的 homography 轉換，最後儲存起來。(使用您擅長的工具,可用 C/C++, OpenCV, Matlab)

2. There are two images given in this assignment. Please manually pickup at least 10 corresponding coordinates on both images by using any Image Viewer Tool, such as Photoshop. Store these correspondences, then, compute their fundamental matrix.

此次作業有兩張照片，請手動點選至少 10 組對應點，記下來寫到您的資料結構中，然後計算他們的基礎矩陣 fundamental matrix 。

3. Please calculate their homography transformation for rectify them either based on your assumption or following the method in lecture slides.

請計算這兩張照片分別需要轉換的 Homography 矩陣使得照片可以被矯正(rectification)，不論是用您所假設的方法或參考講義做法。

4. In midterm project, you can use least-square method, DLT (SVD), openCV function, 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。

5. Please write an TWO-pages document for describing how you implement. Draw a mark for each feature and inset this image with marks in the document for assisting your statement.

撰寫 2 頁簡易說明文件，並請將特徵點標示照片中插入頁文件，以便於呈現與說明。

6. 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) Two-page description saved in doc(or pdf) file format. Please zip all your files, then, upload on moodle by due 5/7 PM11:55.

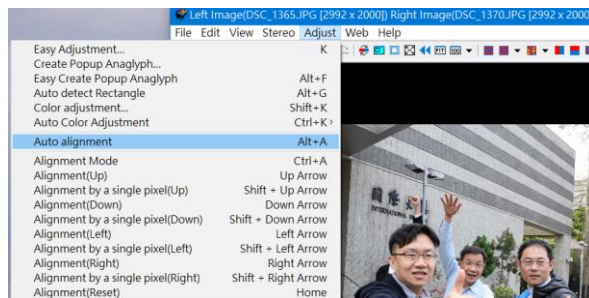
請繳交 3 種檔案 1)程式原始檔，並在內文加簡易註解，2)執行檔，該執行檔可執行老師提供的檔案，3)一頁簡易說明(以 ppt, doc 或 pdf 儲存)。請將所檔案壓縮，並在期限內 5/7 晚上 PM11:55 前傳到 moodle 。

Hint:

1. the snapshot of images in this assignment:



2. You can compare your result with “auto alignment function” in “stereo photo maker software” (<http://stereo.jpn.org/eng/stphmkr/>). Link: <http://stereo.jpn.org/eng/stphmkr/file/stphmkre520.zip>.



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