NTUST course: Computer Vision and Applications (CI5336701, 2022 Spring)

Homework#2：Swap the contents of two photo frames in an image by homography

Date Due：2022. Apr. 5th, PM11:55。

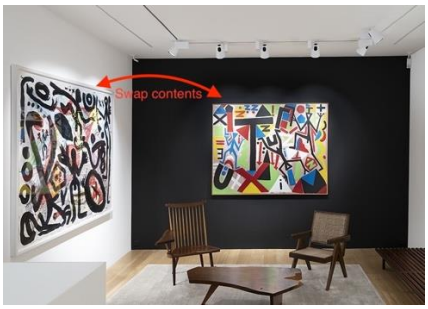
Description

---

1. Writing a program for reading a JPG image, calculating homography mapping matrixes between two photo frames in "ArtGallery.jpg" (shown in bottom), swapping them, and generating a new fake image. (choose your tools, ex. Python, C++/C, Matlab).
2. Please manually define the pixel-region of these photo frames (for example, use one image-viewer, e.g., XnView, to find coordinates on images and write them down), and no need to write mouse interface for picking up the points. And, manually select at least 4 corresponding point sets for estimating a 3x3 homography matrix. After you swap the regions, please save it as another JPG file (named as ID.jpg).
3. In this homework, you can use least-square method, DLT(SVD), OpenCV function (e.g., findHomography), Matlab, or any other ALGORITHM to archive this purpose. Note: please do NOT directly use any commercial software to create the image for this assignment.
4. There are several features your program should have:
   1) Calculation of homography matrix (between two photo frames) from point sets.
   2) Able to define the region, says pixels within two frames, which will be processed.
   3) Able to swap contents of two photo frames.
   4) Save as an image (ID.jpg).
5. Deliverable: (2~3 items)
   1) Source code in Python, C++/C or Matlab with simple comments.
   2) Execution files (.exe and related dynamic link file .dll), if applicable. This is optional.
   3) The result image created by your program.

   Please zip all your files, then, upload to moodle2.

Hint: the snapshot of image in this assignment, (source JPG image will be given)



(blank below this line)