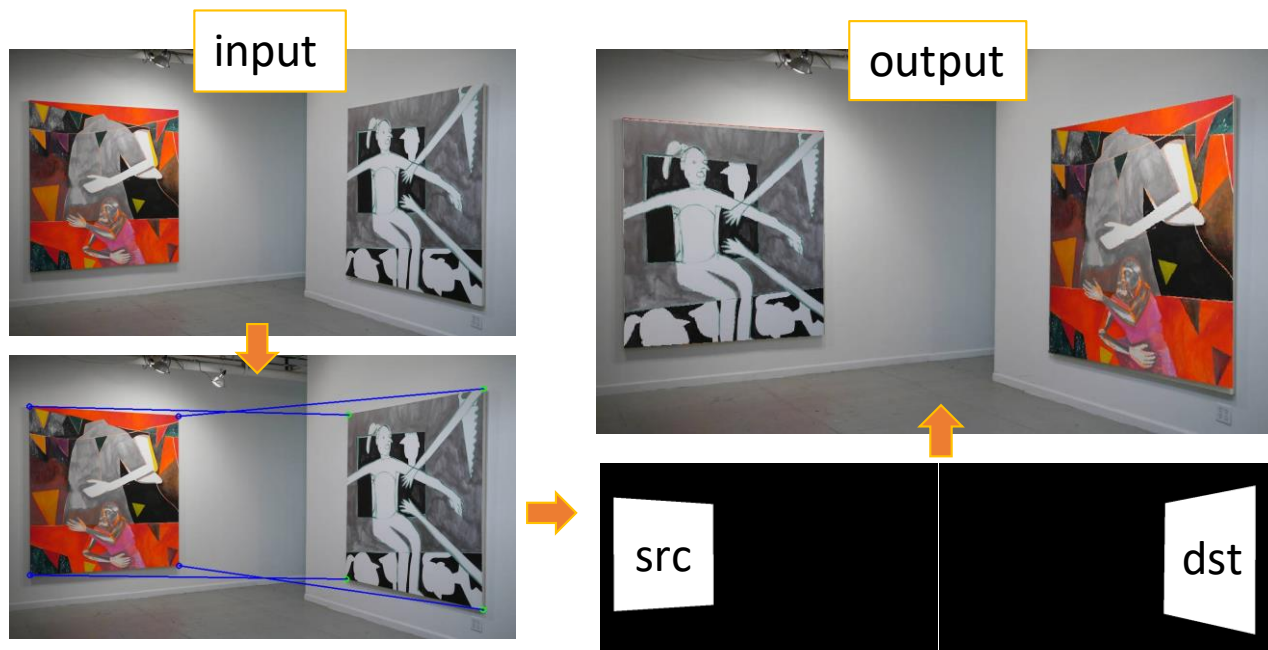# Homework#2 Using homography to swap the contents of two photo frames

1. 手動標註對應的point pair
2. 計算homography
3. 根據corner繪製要從重新sample顏色的區域
4. 落在src區域則pixel乘上H 取的新的color, 反之落在dst區域則乘H^{-1}

input

output

src

dst

In matrix form:

$$\begin{bmatrix} x & y & 1 & 0 & 0 & 0 & -x'x & -x'y \\ 0 & 0 & 0 & x & y & 1 & -y'x & -y'y \end{bmatrix} \begin{bmatrix} h_{11} \\ h_{12} \\ h_{13} \\ h_{21} \\ h_{22} \\ h_{23} \\ h_{31} \\ h_{32} \end{bmatrix} = \begin{bmatrix} x' \\ y' \end{bmatrix}$$

If you have one set of correspondence, you get (x, y) & (x', y'). So, you need at least four correspondences for solving 8 unknowns. Note: here, one correspondence forms two equations (需要四組對應點)

8 unknowns to be solved

Homography算法取自
Lecture03-projective 2D geometry