CS4363/5363 Computer Vision

Fall 2018

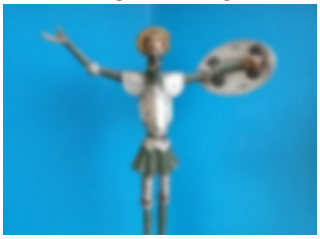
Exam 1 - Makeup work

1. (8 points) Write functions to perform each of the transformations shown below given the original image. You cannot use built-in open CV functions, or numpy flip or rotate functions. The original image can be found in the class webpage.

Original image

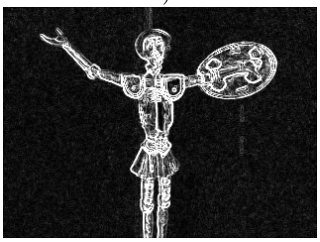
a)

b)



c)

d)



e)

2. (10 points) Blue screening is commonly used in digital photography and movies. It consists of replacing an artificial uniformly colored background by a more interesting one. Write a function to perform blue screening. Your function should receive a foreground and a background image and return the resulting composite image. You may assume that the foreground image is smaller and that no resizing is necessary. Align the foreground image with the bottom-right corner of the background image.

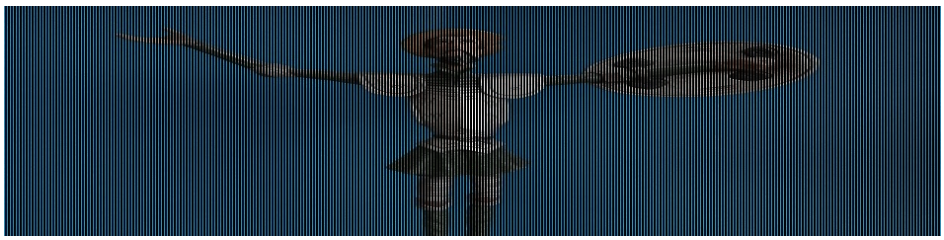
a) Background image

b) Foreground image

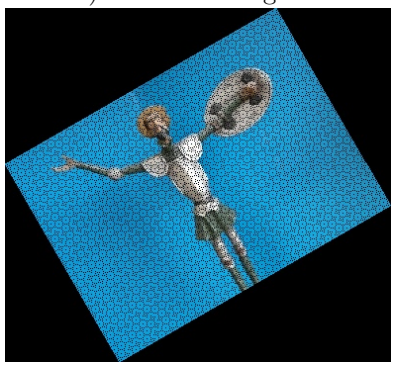
c) Composite image

3. (12 points) The program *homography_forward_warping.py* located in the class web page leaves empty pixels when performing (some) transformation, due to the nature of forward warping (see images below). Modify the program to perform backward warping to solve this problem.

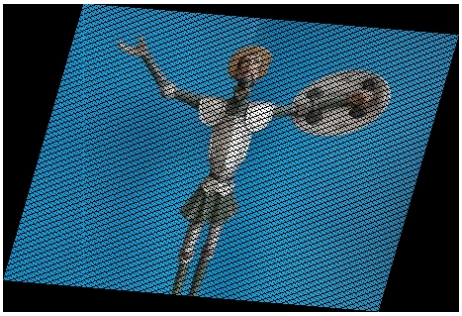
a)Rotated 90 degrees



b) Stretched



c) Rotated 30 degrees



d) Affine transformation

Instructions for submission: Send an email message to olacfuentes@gmail.com with subject "Vision Exam 1". Your message should contain as attachment a single file named *exam1_your_last_name.pdf*, with your code and results. Deadline: October 30, 11:59 p.m. Work is STRICTLY individual.