Face Morphing

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First, I picked images that kind of had the faces in the same area, and cropped them to be the same size. If they weren't the same size by a few pixels, I would pad the remaining rows/columns with zeroes. I picked over 20 corresponding points between the pairs of images.

Then, I used the delaunay triangulation built in method in Matlab to get all the triangles that can be formed with the points I chose. Then with the tform method, I used affine transformation to find the transformation matrix that goes from one triangle to the other. I took a lot of time trying to figure out what affine transformations were… but turns out it is just a series of simple linear algebra steps. You basically just solve for T in AT = B, using matrix multiplication and inverses.

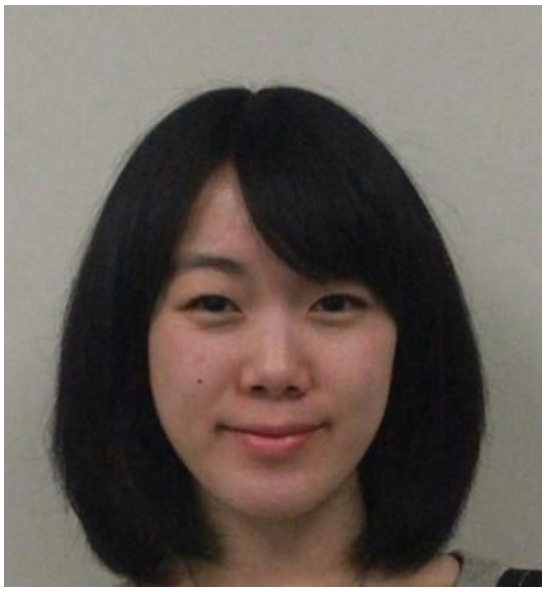
I also used the mytsearch method to learn which triangle each pixel falls in. Then I looped through every pixel in a blank height*weight image (this is a base image for both the source and target images). For every pixel , I would find the corresponding triangle for that pixel, and thus the corresponding transformation matrix for that pixel. I use that transformation matrix to find where the pixel (in the base image) would be in the source image. Then I save that coordinate. Then I use interpolation to figure out what color would that base pixel be, if it was in a different coordinate (the target coordinate).

I do this for 61 different combinations of the two (source and target) images to create a gradual change from one image to the other. I put it all together into a gif included in the zip file. All the images are also included in the zip file.

Pair 1

Data set is taken from http://www.ics.uci.edu/~fowlkes/class/cs116/hwk2/faces/, which is the data set linked to from the Irvine project page for Face Morphing. I realize this is kind of creepy, to use other student's faces… but the images were so perfectly aligned and cropped.

Original Images




Midway face (this is just frame 30)

Pair 2

This is an image of Priyana Hannan (another Mudd student) and me :D

Original Images

Midway Face

I realized that this combination would be a challenge, since my image wasn't facing the camera head on. So the progression would have had to turn my face a little bit. The faces have to be pretty much aligned for this to work smoothly (for example, the eyes have to be in the same place, and the mouth, to make it look less distorted.

In the images taken from UCI, we can see that the midway face is kind of like what their children would look like. However, the midway face for the second pair is just so misaligned that it doesn't look like one face.

P.S. I used https://imgflip.com/images-to-gif to create these gifs.