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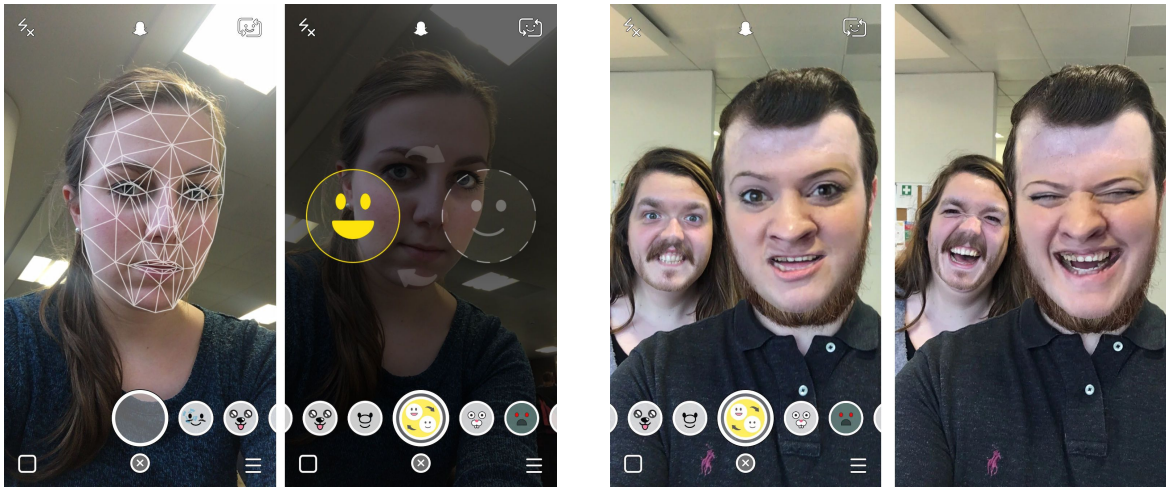
Project Summary

Inspired by Snapchat's face swap filters, this project primarily takes on the task of creating a swap between specific parts of the face and smoothing it out to make it look natural. Also inspired by the face morphing softwares that is pervasive nowadays on Facebook, this project also implements a morphing component by adding a time component and creating a video of the face morphing from one to another.

Snapchat's Face-Swap Idea:

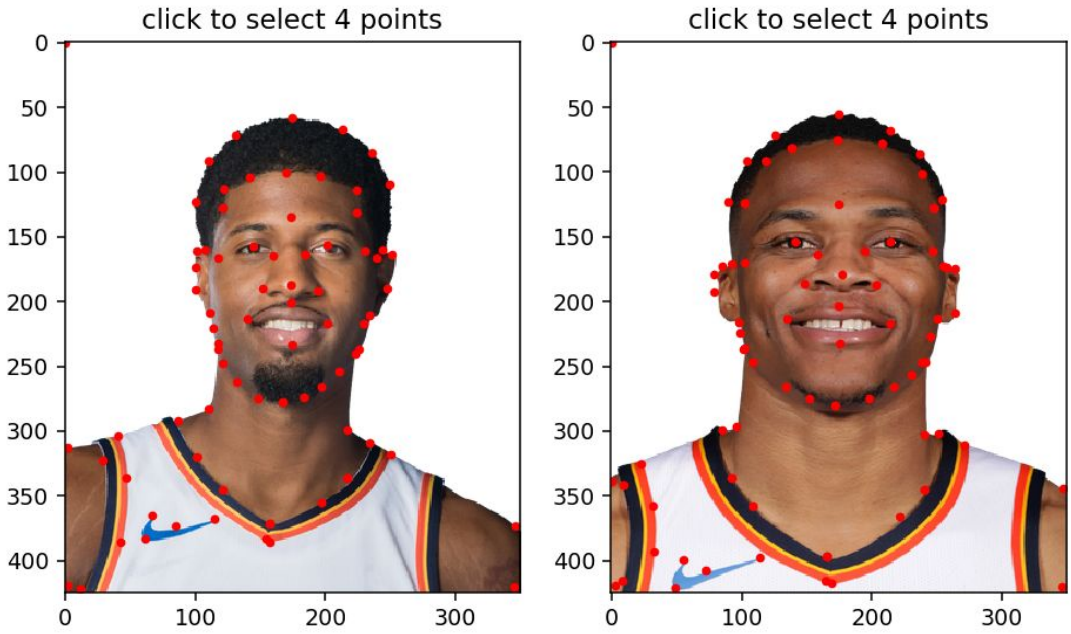


Face Morphing Idea:

(scroll down for my results)

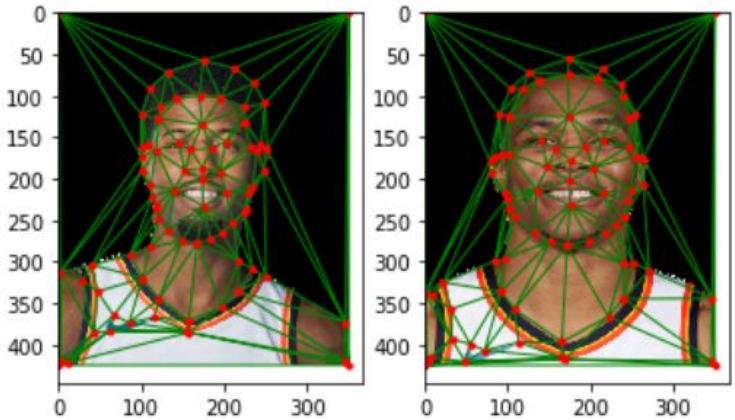
My Results:

STEP 1: I selected photos of my two favorite basketball players and in groups of 4, selected and stored their corresponding facial points (eye-to-eye, ear-to-ear, etc). I had to do this part manually unlike Snapchat's real-time recognition of these points on two faces.

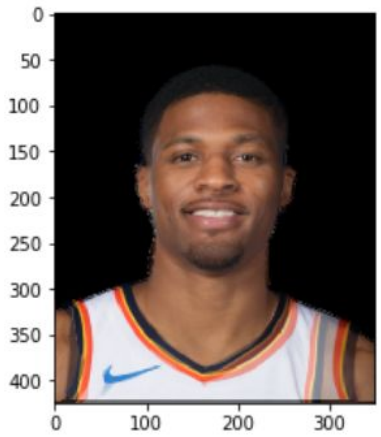


STEP 2: First I implemented the face morphing like Brad Pitt/Angelina Jolie's example from above. So given these points I calculated the triangulations, then applied a piecewise affine warp, and then generated a morph sequence which starts with one face image and smoothly transitions to the other face image by simultaneously warping and cross-dissolving between the two.

Triangulations:

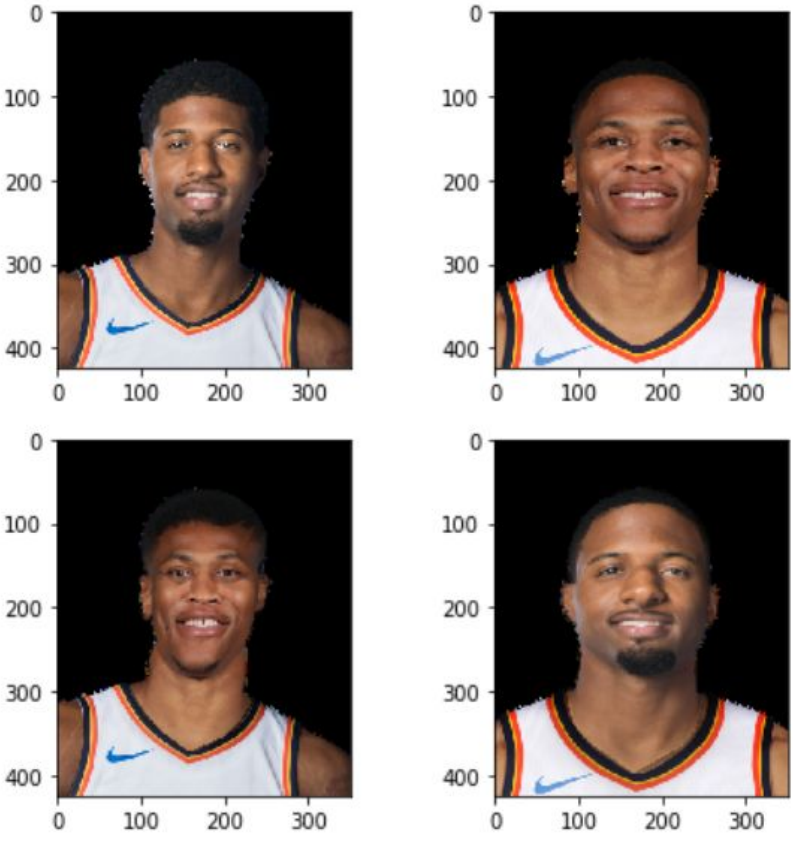


Morph sequence at time t = 0.5 of the resulting clip:



For those that know the two players can appreciate this even more. I was really happy with this result.

STEP 3: Now for the face-swap, my results were a bit more cruder than the face morph, but I was still generally happy with them.



I hope that this document was able to give you a general idea of the ideas behind the project and how my results turned out. Refer to the python notebook to understand specific parts of the algorithm as the code has plenty of comments.