**CSC 545/645 Computer Speech, Music and Images**

**Exercise No. 10a, Week 13, April 18, 2021**

**Chromakey**

**Goals**

Put a man on the moon

**Background**

Chromakey, also called “green screen,” is a method of inexpensively transporting people to exotic locales. It is commonly used in movies, where the actors carry out their roles in front of a green background which is replaced, in video frames, by a scenic background. The weather person on television newscasts also stands in front of a green or blue screen; the weather map is superimposed on the background.

**Procedure**

Write a Processing program to change the background of subjects standing in front of a blue or green screen. Skeleton code (Ex10a\_Chromakey) is provided on Blackboard. The code loads a foreground image and background image that are the same size. There are a number of other images in the data folder intended for chromakey applications. Modify the program to replace the background in the foreground image with the background image—but don’t overwrite the foreground people or objects. Also modify the image so it can accept a background image that is larger than the foreground image, in which case it will resize the background image or use only part of it.

There are a couple of suitable background images in the data folder (for example, you could put the basketball player on the moon, or perhaps you could give Neil Armstrong some company—which might require reflecting either background or foreground image around its vertical axis), but feel free to use others.

**Chromakey algorithm**

The chromakey algorithm is simple: scan each pixel of the foreground image. If the pixel is the background color (usually green or blue), replace the foreground pixel with a pixel from the background image. The only real problem is that it can be tricky to determine if the pixel is the background color—shadows and shades of illumination can make the color vary. One possibility, when using a blue screen, is to compare the blue value against the sum of the red and green values; if the blue value is greater, then it’s a background pixel. That may not work for all images.

**Deliverables**

Submit your pde file on Blackboard before the due date.