

## Lab 8

### Goals

The goals for this lab are:

1. Practice using images in Processing
2. Practice manipulating pixels of an image
3. Practice using arrays
4. Practice writing for loops
5. Practice controlling animation variables to control how much of each image to display

### Modality

**This is a pair-programming lab - please form teams of two people and trade off typing in commands and giving instructions to they-who-are-typing.**

### Details

**Tasks:** This lab will be an image morph which transitions from an image of one student to another. You will need two images as input to the lab and your program will 'morph' from one image to the other. Since we will be using a fairly simple morph (a linear transition from a pixel in one image to the corresponding pixel in the other image), it is important that the images are as similar to one another as possible. The images must be exactly the same pixel width and height (for simplicity) and should be black and white images, one of each students face.

To complete this assignment, please follow these steps

- Take a picture of each of the students completing this lab - pictures should be front facing.
- Transfer the pictures to the lab computers (via email, etc.) and edit the pictures in Photoshop to make them exactly the same size and relative locations (i.e. try to make the position of each student's eyes match from one image to the other). Convert the images to black and white.
- Write a processing sketch to read in each image and load in each images pixel
- Start by writing code to make sure you can display each image, one at a time
- Allocate another image, the morph image
- Compute the difference in brightness for each pixel between the two input images
- Program your sketch to start with one image and slowly add one tenth of the difference in brightness until the morph image completely transitions to the other image. (have your morph only start once the mouse is pressed and control the frameRate to make the morph play slowly (e.g. frameRate(1))

## Demo:

In order to receive credit for this lab, you and your partner must demo your sketch to your instructor along with handing in the image and sketch via handin. Ask your instructor for details.

## 1 Resources

some useful commands:

```
PImage img1;  
loadImage  
createImage  
loadPixels  
updatePixels  
brightness  
image();
```

Here are four images, showing an example morph:



Figure 1: Morph starts with a single image of a person and then starts to transition to the final image

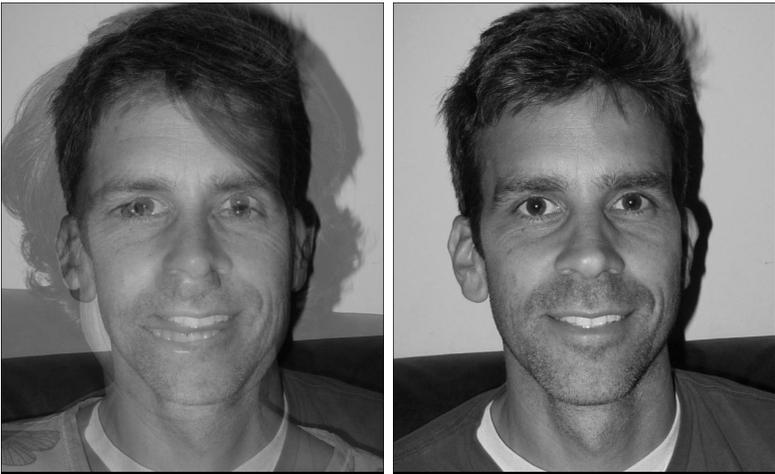


Figure 2: Morph continues to transition until the final image is the face of the other person

Here is a sample program that loads in an image and manipulates the pixels to give you a model of interacting with an images pixels:

```
//CSC 123 example of some image manipulation operations
//ZJ Wood

PImage img1, outImg;
int loc;
color pix1;

void setup() {
  size(630, 781);
  background(0);

  img1 = loadImage("data/Z.jpg");
  outImg = createImage(img1.width, img1.height, RGB);

  //load up the pixels of each image as we will access them one by one
  img1.loadPixels();
  outImg.loadPixels();

  //copy the values from one images pixels to another if the brightness is about treshold
  for (int y = 1; y < img1.height-1; y++) {
    for (int x = 1; x < img1.width-1; x++) {

      //translate 2D image location to a 1D array location
      loc = x + y*img1.width;

      pix1 = img1.pixels[loc];

      if (brightness(pix1) > 128) {
        //copy over the value from one image to another
        outImg.pixels[loc] = img1.pixels[loc];
      }
    }
  }
}

void draw() {

  image(outImg, 0, 0);
}
```