Fancy Captures

SM2715 – Creative Coding

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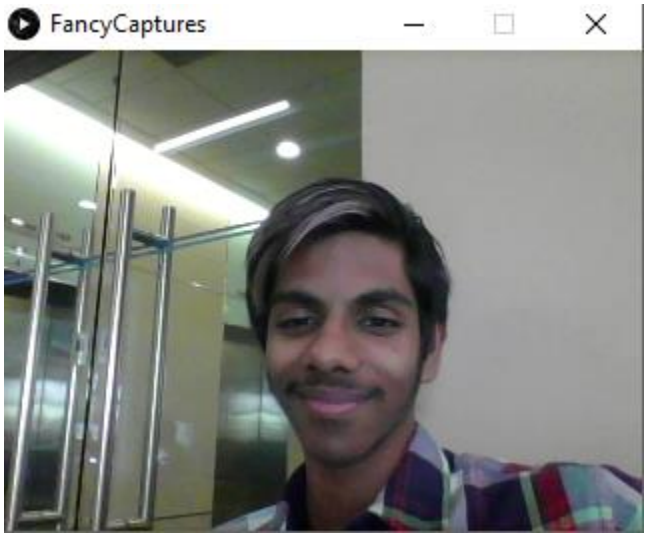
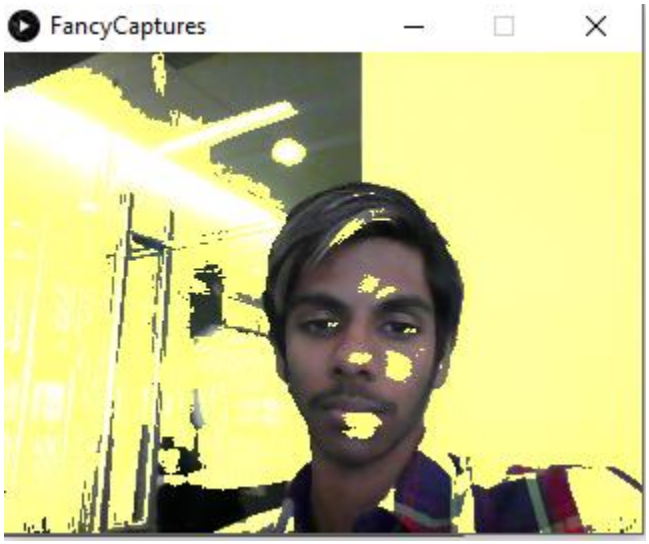
Flow of Sketch

- Initial Screen

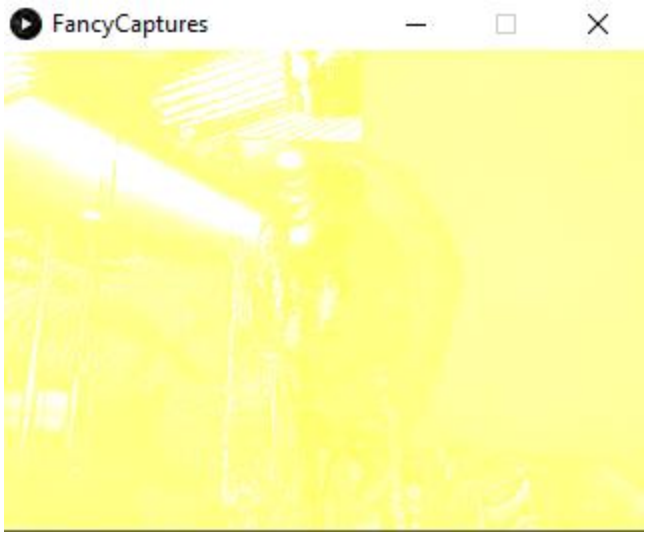


- After First Mouse Click



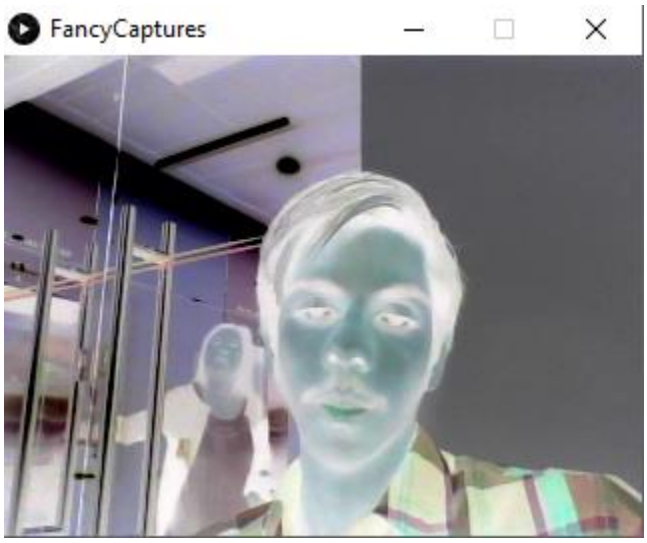
  - Image is changed according to the contrast stretching algorithm.

- After some body movement



  - Detects the change in movement and applies the contrast stretching.

- After 2nd Mouse Click

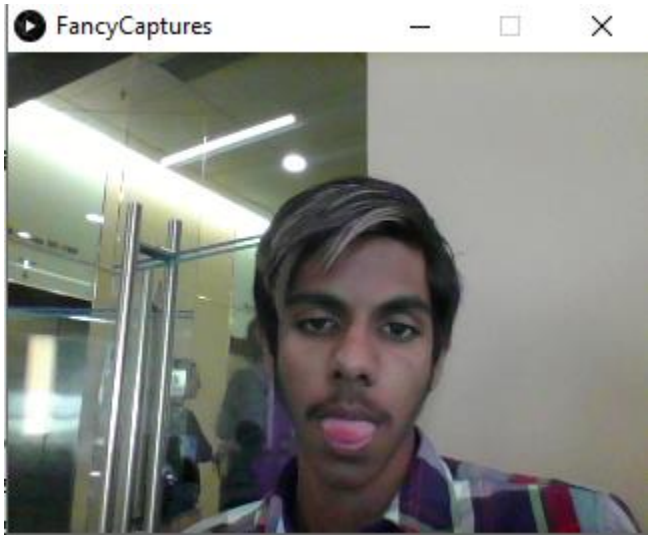


  - Inverts RGB value of each pixel

- After 3rd Mouse Click

  - Convert each pixel according to RGB dominance

- If Clicked again



  - Reverts to normal display

Follows the same loop if clicked again.

Description

The sketch intents to perform different kinds of capture. Each mouse-click action changes the filter of the captured image. Basically, it has 4 filters:

1. Normal Capture

   Just displays the captured image as the way it is.

2. Contrast Capture

   Displays the image after contrast stretching it.

3. Invert Capture

   Displays the image after inverting all the colour values of each pixel in the image.

4. Dominant Capture

   Displays the image after finding the dominant RGB of each pixel in the image and applying that colour as the filter for that specific pixel.

Coding Techniques

The whole code is written in a clean and simple format. It contains meaningful variable names and comments which explain the code. Some of the key techniques used are:

- Capture Class
- Pixel Array Manipulation
- Self-defined functions like normalCapture(), contrastCapture(), invertCapture() and dominantCapture().

How Code Works?

Initially the image is loaded to the screen using Capture class. It detects all the mouse clicks and after every click it changes the filter. The different filters work in the following manner:

1. Contrast Capture

   It works according to the algorithm shown in the image below.

   Algorithm 3-1: Contrast Stretch

   INPUT: q-bit image I

   $MP = 2^q - 1$ *(e.g. 255 for 8-bpp image)*
   $a = \min(I)$
   $b = \max(I)$
   $R = b - a$

   foreach (pixel p in I)
     p = [(p-a)/R]MP *(apply linear scaling function)*
     p = round(p)
   end

2. Invert Capture

   It works by going through the whole pixel array and inverting colour values for each for each of them.

3. Dominant Capture

   It works by going through the whole pixel array and compare the red, green and blue colour values. Then updates the pixel value according the highest value as the filter.

Artistic Concept and Inspiration

Instagram and snapchat applications use different kinds of filter. After using them, I was amazed how the applying different filters completely changes the beauty of the image. I had no idea that the chemistry of different filters could produce something so aesthetic. Some of the filters I looked at for inspiration are Normal, Clarendon, Juno, Lark, etc.

It made me think about creating my own filters in which the expression of image is changed. So, in this assignment I tried to create 3 different filters and produce something unique. These filters can be easily changed by just clicking the mouse. Since all the actions are real time, it makes it more fun.

References

1. http://processing.org/
2. http://what-when-how.com/embedded-image-processing-on-the-tms320c6000-dsp/contrast-stretching-image-processing/