

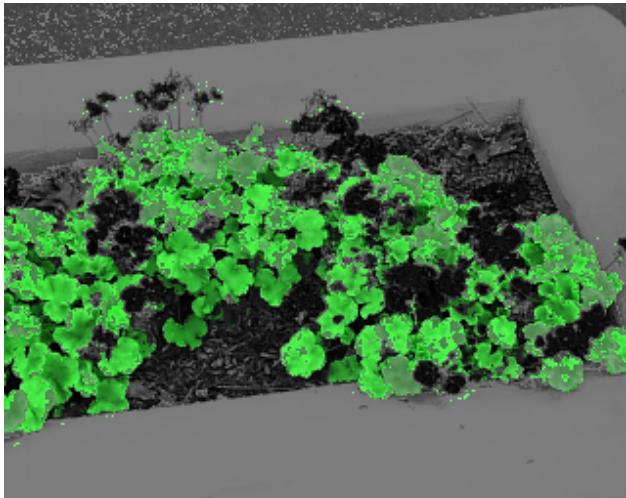
Project 1

Summary

This project served as an introduction to image representations in C. We were tasked with reading and writing images to create a mask and use it composite image of a background and foreground image.

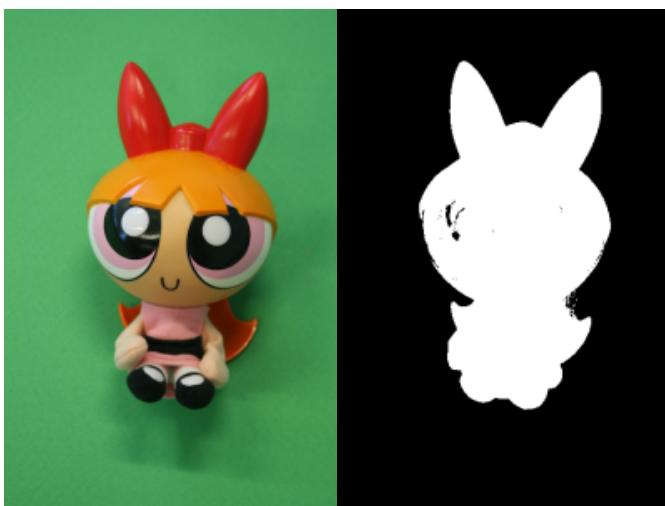
Required Images

Something Interesting:



Here I modified the code from `ppmmain.c` a little to emphasize the green in the image and grayscale the red and blue. This required little more than swapping out the references to the red channel with the green channel and references to the green channel with the red channel.

Mask and Composite



Above are the source and mask images respectively. I created a program `mask` which takes as input the filepath to the source `ppm` imagefile and a threshold for which to create the binary mask.



Above are the background and composite images respectively. I created a program `composite` which takes in four arguments:

- the filepath to the foreground image
- the filepath to the background image
- the filepath to the mask image
- the filepath for the output composite image

The program overlays the foreground image onto the target image by referencing the mask image and computing the final pixel value using the following function, where `alpha` is the corresponding pixel value in the mask image:

```
I = alpha*foreground + (1 - alpha)*background
```

I then added an option two args `dx` and `dy` which provide an offset to position the image with. As you can see from the composite image above, the offset can result in the foreground image spilling over the bounds of the background image. In this case, the foreground image will be cropped at the bounds of the background image.

Extra Images



For this image I superimposed a pug on top of an allied tank liberating a city during WW2.



One of these things is not like the other.

Reflections

This was a fun introduction to C programming and image representation and manipulation. When I was in middle school I played around with green screen effects for a short film I made. It was interesting to learn how those effects were implemented in code. There are so many ways to expand upon these simple programs, adjusting the transparency of each image, duplicating the foreground, playing with the colors. I may revisit this project and add more functionality.

References

- Prof. Maxwell's `ppmmain.c` file
- [Makefile tutorial](#)