

ENAE 380: Lab 05

Due on November 3, 2024 at 11:59 PM

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Problem 3.1.3: Color Filtering

It took my computer 0.05410289764404297 seconds to run the numpy variant, and 0.053965091705322266 seconds to run the python variant.

Problem 3.4: Image Segmentation

Instead of finding a color combination that works for all of the images, I simply created an array with individual highlight and shadow HSV tuples to be used with each image:

```

1      # define highlight and shadow ranges for each tiger image
2      highlights_hsv = [
3          (20, 255, 255),
4          (17.5, 255, 255),
5          (20, 255, 255),
6          (20, 255, 255),
7          (45, 255, 255),
8      ]
9      shadows_hsv = [
10         (0, 0, 0),
11         (10, 0, 0),
12         (0, 0, 0),
13         (0, 0, 0),
14         (0, 0, 0),
15     ]
16

```

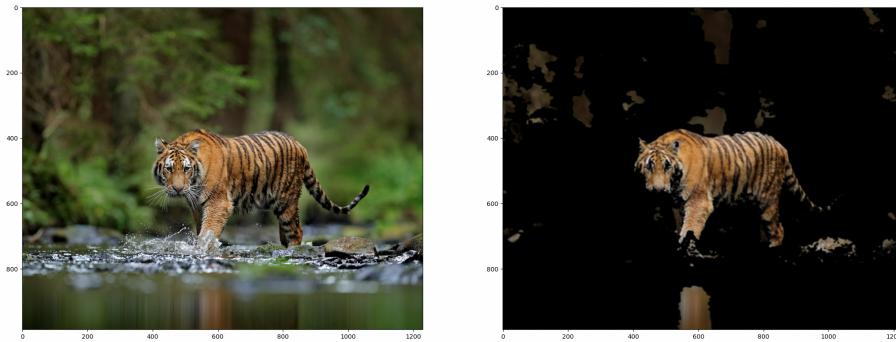


Figure 1: Tiger Segmented 1

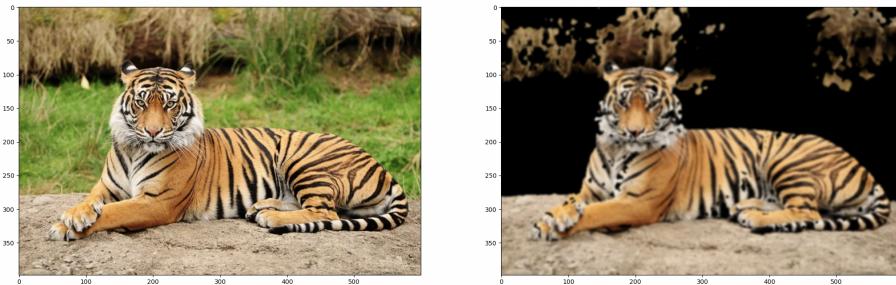


Figure 2: Tiger Segmented 2

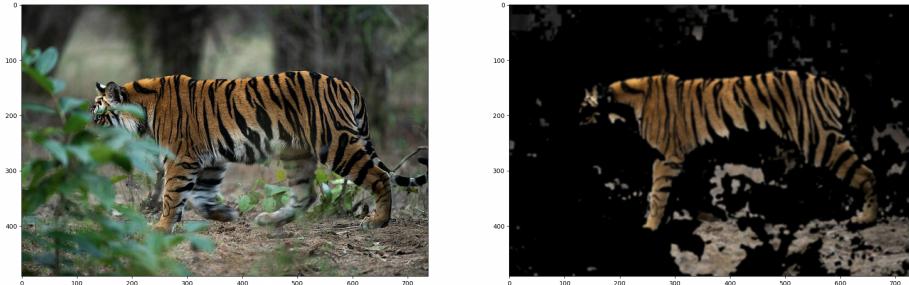


Figure 3: Tiger Segmented 3



Figure 4: Tiger Segmented 4

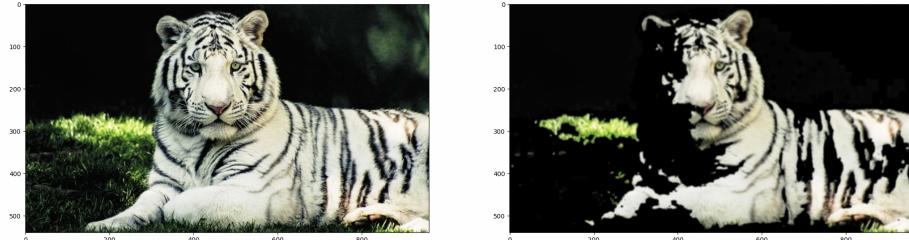


Figure 5: Tiger Segmented 5

Problem 3.5: Astronomy Image Processing

To create these images, I used `MAST` to download the `FITS` files, then used `Siril` to convert the files into a linear colorspace that is viewable for humans, and to register the images such that the stars are all aligned. Then I used `Photoshop` to modify the Hue for each image layer and composite them all together.



Figure 6: Pillars of Creation Original

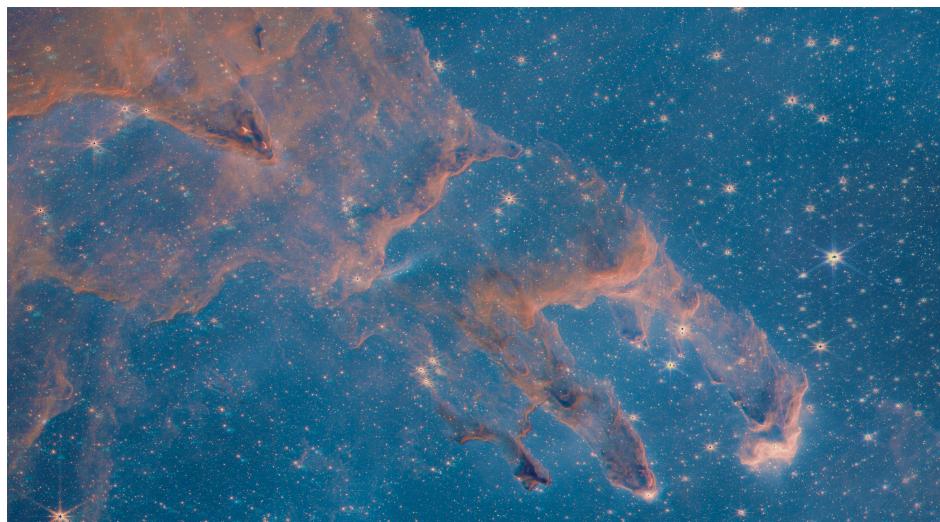


Figure 7: Pillars of Creation Recreation

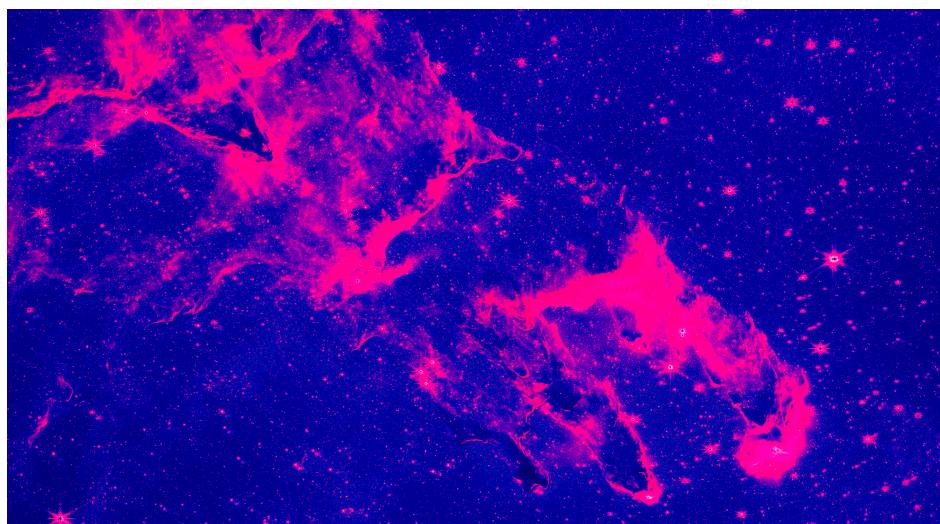


Figure 8: Pillars of Creation Fun Version