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Homework 10

### **Abstract**

We use homography in order to perform transformations on images in order to correctly align elements in an image. We also use the Mahalanobis distance in order to segment an image based on specific colors, in this case, orange.

### **Conclusion**

For homography, there are a few parameters that must be chosen. First, we must choose the fixed locations that we want the part of the image to transform to. For the paper signs, I used ginput in order to locate the initial corners of the paper. From there, I put a fixed location of a rectangle and used fitgeotrans on the two sets of points. Another attribute I had to choose was what type of transformation to use. Since the paper was on a table, and the image was taken at an angle, there needed to be a projection transformation to make it a flat 2D view of the paper.



The Mahalanobis algorithm, after testing rgb and hsv, lab still seemed to be the optimal color space to find the oranges, given the sample code. Since  $a^*$  is the shift from red to green and  $b^*$  is the shift from yellow to blue, orange would be a combination of red and yellow, so it would be clustered further from green. Also, the lack of wrapping makes it a better color space than hsv.

