Indian Institute of Technology Delhi

Image Rectification

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1 Introduction

In this assignment we implemented image rectification, namely, affine rectification and metric rectification. The user select four points in image which should lie in a rectange and it outpus the rectified images.

2 Affine Rectification

Affine rectification was done using the following algorithm:

- Using the selected points we construct two pairs of lines which should have been parallel in eucledian space.
- Next we calculated the intersection points of these lines in the image space.
- Using these intersection points we calculated the line at infinity in the image.
- Then we constructed a homography which transforms line at infinity to its canonical form.
- This is the homography that we then use to affine rectify the image.

3 Metric Rectification

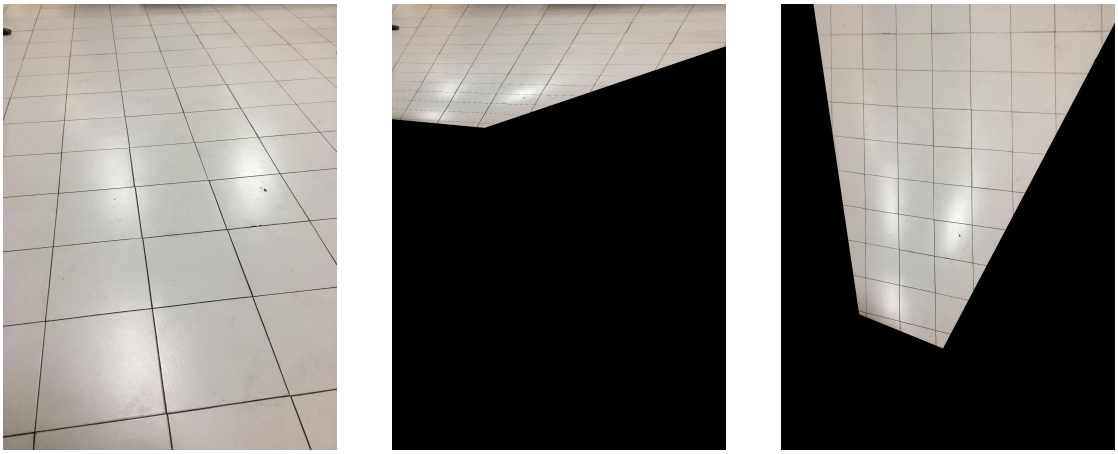
For Metric rectification we used the following method:

- We constructed a rectangle located approximately at the image conordinates of the selected points.
- We then constructed a projective transformation that transformed the input points by the user to the points of the constructed rectangle
- This is the homography that we then use to metric rectify the image.

This method is sound because the transformation that maps the input points to the rectangle, actually moves the conic dual to circular points to its canonical location in the metric corrected image.

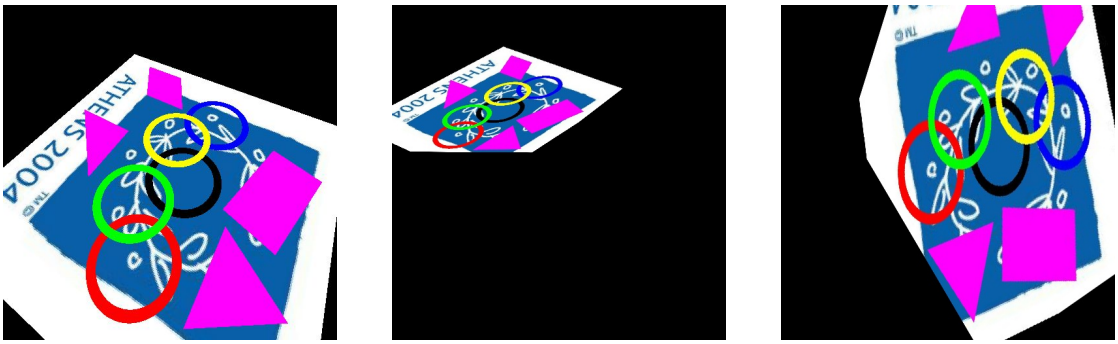
4 Results

We ran the program on a sample set of images which were freely available in the internet (Google image search). Some of the the results are given below:



(a) Original (b) Affine (c) Metric

(d) Original (e) Affine (f) Metric

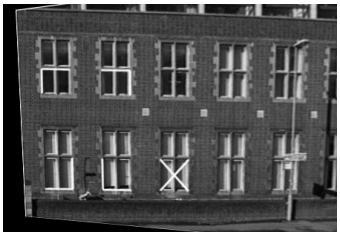


(g) Original (h) Affine (i) Metric

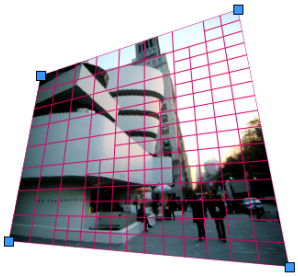
Figure 1: Some Sample Results

(a) Original

(b) Affine

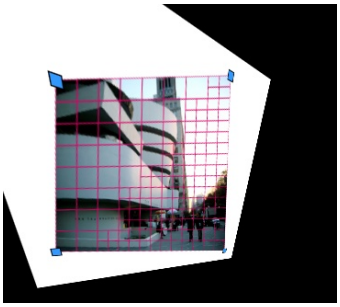


(c) Metric



(d) Original

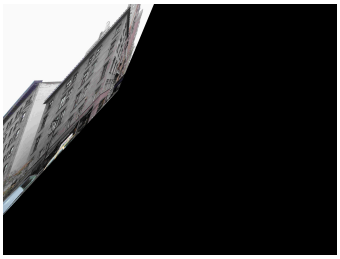
(e) Affine



(f) Metric

Figure 2: Some Sample Results

(a) Original



(b) Affine

(c) Metric

Figure 3: Some Sample Results