|  |  |
| --- | --- |
| 1.1 | multiplies out to be |
| 1.2 | Since the line has no x component, that means it’s parallel to the x-axis |
| 1.3 | The second answer is pretty obvious, given in the lecture slides:  and  For the first answer, compounding translations are additive, so  Compounding rotations are multiplicative, so |
| 1.4 | Suppose we construct a reference frame such that the mirror is on the plane  One point on the object is in homogenous 3D coordinates and with image coordinates  Let’s also assume that the camera is not rotated relative to the frame, so , and its translation  The image of the object in the mirror is the same as the image of another object placed symmetric about the mirror plane. Let’s call the same point on the new object  The image of the new point on the original camera is  Since the object can have any number of points equidistant from the mirror (same ), this should hold for all and . Still, I don’t see that this would restrict F to being skew-symmetric. Must have gone wrong somewhere along the way? |
| 2.1 |  |
| 2.2 |  |
| 3.1 |  |
| 3.2 | Pulled directly from Hartley and Zisserman  For , , , |
| 3.3 | or |
| 4.1 |  |

|  |  |
| --- | --- |
| 4.2 |  |
| 5.1 | I used the original calculation of F as my error metric: . I counted all points with error below a threshold as inliers. Additionally, I took random sets of 15 points instead of 8 points. More points means that it’s more likely there will be points from all around the image, but 15 is still small enough that many of the 10000 iterations will be all inliers and no outliers.  Plugging all the points in eightpoint came out with a trash result, but using ransac wasn’t colossally better. For example, in both cases, the result had an epipole in the image, whereas the noiseless correspondence results in the epipole being outside the image. |