Computer Vision

Assignment 1

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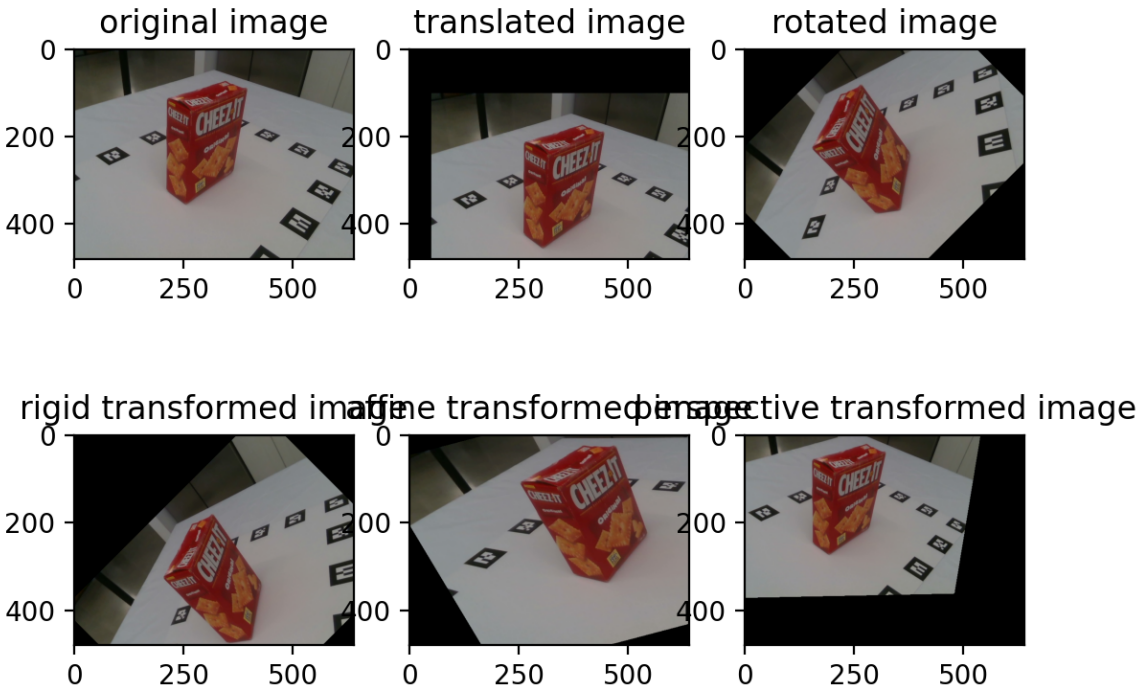
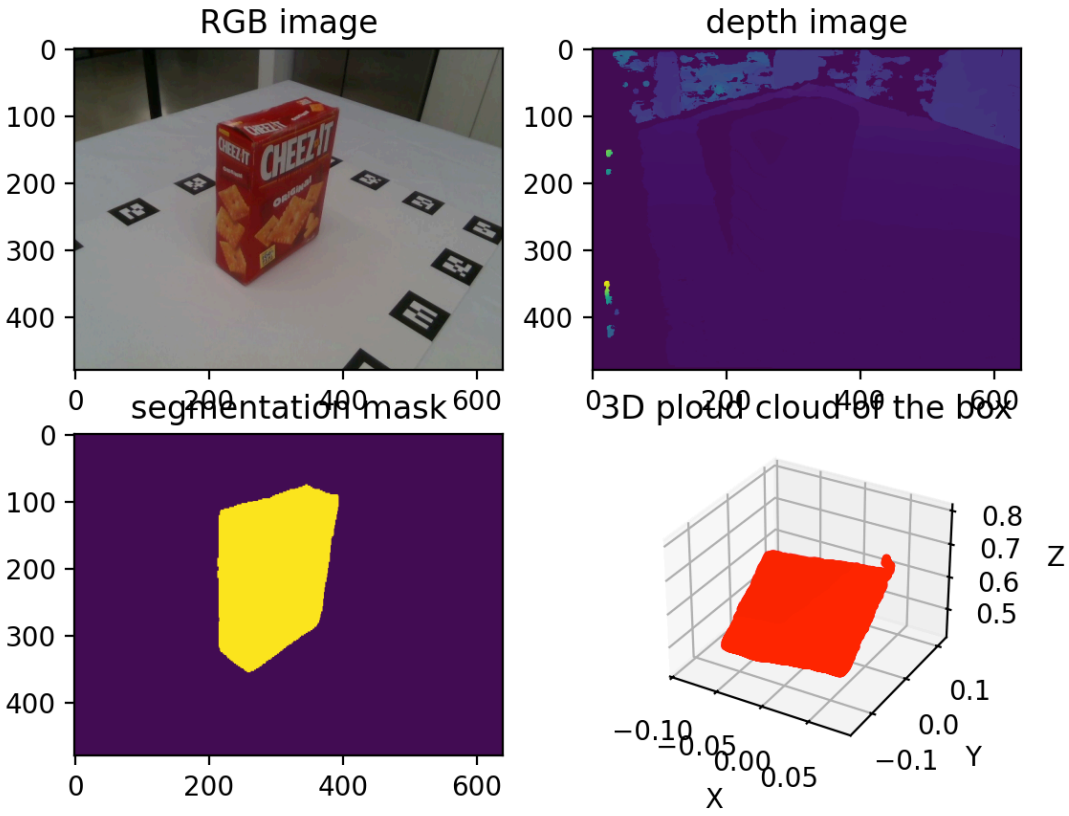
1. Image Transformation Output:

```
(venv) sumitkumar@Mac homework1_programming % python3 image_transformations.py
2D translation
[[  1.   0.  50.]
 [  0.   1. 100.]
 [  0.   0.   1.]]
2D rotation
[[  0.70710677   0.70710677 -75.9798    ]
 [ -0.70710677   0.70710677 296.56854   ]
 [  0.           0.           1.        ]]
2D rigid transform
[[  0.70710677   0.70710677 -25.979797  ]
 [ -0.70710677   0.70710677 396.56854   ]
 [  0.           0.           1.        ]]
Affine transform
[[  1.2666667    0.6        -83.333336  ]
 [ -0.33333334   1.          66.666664  ]
 [  0.           0.           1.        ]]
Perspective transform
[[ 1.05587376e+00  9.18151097e-02 -6.50969128e+01]
 [ 4.69010049e-02  1.12562412e+00 -7.57920240e+01]
 [ 1.83251448e-04  5.13337001e-04  1.00000000e+00]]
```



2. Backproject Output:

```
(venv) sumitkumar@Mac homework1_programming %
(venv) sumitkumar@Mac homework1_programming % python3 backproject.py
intrinsic_matrix
[[618.01727295   0.         312.37695312]
 [  0.         618.00335693 232.37530518]
 [  0.           0.           1.        ]]
(37825, 3)
```



3. Correspondences output:

```
(venv) sumitkumar@Mac homework1_programming %
(venv) sumitkumar@Mac homework1_programming % python3 correspondences.py
intrinsic_matrix
[[618.01727295   0.         312.37695312]
 [  0.         618.00335693 232.37530518]
 [  0.           0.           1.        ]]
[[257 142]
 [363 165]
 [286 276]] (3, 2)
3D points in camera 1:
[[-0.03942585 -0.06434453  0.44      ]
 [ 0.04439632 -0.05908935  0.542     ]
 [-0.0225777   0.03734197  0.529     ]]
(4, 4) (4, 4)
2D projections in image 2:
[[275.63360559 369.11942646 305.93956506]
 [183.08107111 135.05309944 263.64084856]]
```