

Website

<https://github.com/Tony-Mao/singleViewModeling>

Image Acquisition

In *singleViewModeling.m*, change input image name in second line. In Demo, that will be 'box.bmp'.

Calculating Vanishing Points

Select 8 points in the image in a 'strange' order, following https://course.cse.ust.hk/comp5421/Password_Only/projects/svm/svm-demo/sonyclie/web/sonyclie.remark.bmp.

Then the vanishing points in 3 directions will be automatically calculated, by the method of computing minimum eigenvector.

Reference result for vanishing points from course grading website:

(3762.42, -1271.5)

(-1847.74, -1262.43)

(464.618, 5804.72)

Choose Reference Points

Then pick a origin in the image, this point will be mark in blue color.

Compute 3D Positions

Select plane and points in plane in the following order. The transformation homography matrix H will be automatically calculated.

Plane 1: v7, v1, v4, v6

Type in: 296 391 1 401 0 0 297 -6

Select 4 points of the texture.

Plane 2: v4 v3 v5 v6

Type in: 0 186 0 0 297 0 297 192

Select 4 points of the texture.

Plane 3: v1 v2 v3 v4

Type in: 401 180 401 0 0 0 0 186

Select 4 points of the texture.

Compute Texture Maps

Texture map will be saved as *texture1,2,3.bmp* and a preview will be presented.

Create a VRML model

The format is as follows:

```
Shape{
    appearance Appearance {
        texture ImageTexture { url "1.jpg"}
    }
    geometry IndexedFaceSet {
        coord Coordinate {
            point [ -3.91 1.95 -2.96, # 3D real location
                  -4.01 1.8 -0.01,
                  0 1.86 0,
                  0.06 1.92 -2.97
                  ] }
        coordIndex [0,1,2,3,-1]
        texCoord TextureCoordinate {
            point [0 1,
                  0 0,
                  1 0,
                  1 1]}
    }
```

```

    }
}

```

Notice that the coordinate defined by VRML is different as project. The coordinate transformation from image to VRML is:

$x \rightarrow -z$

$y \rightarrow -x$

$z \rightarrow y$

The three converted real coordinate for box is as follows (shrink size by 100):

-3.91 1.95 -2.96,

-4.01 1.8 -0.01,

0 1.86 0,

0.06 1.92 -2.97

0 1.86 0,

0 0 0,

0.06 0 -2.97,

0.06 1.92 -2.97

-4.01 1.8 -0.01,

-4.01 0 -0.01,

0 0 0,

0 1.86 0