1.
sensor width w = 1280/15 mm
sensor height h = 1024/15 mm

for f = 50mm
horizontal FOV = 2*atan(w/2f) = 80.95
vertical FOV = 2*atan(h/2f) = 68.64

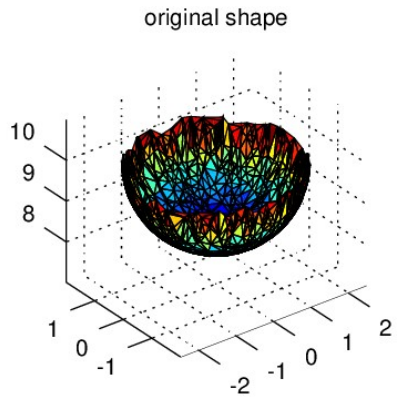
for f = 100mm
horizontal FOV = 2*atan(w/2f') = 46.21
vertical FOV = 2*atan(h/2f') = 37.69

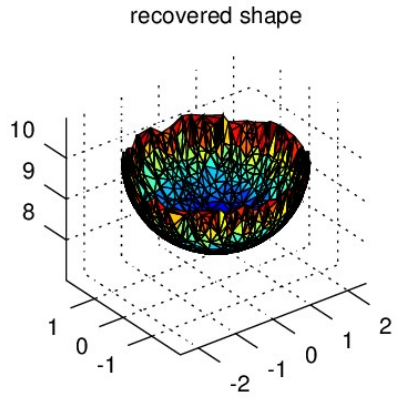
FOV decreases almost by half

2.
R = [0 0 1; 0 1 0; -1 0 0]
t = [-2; 0; 0]

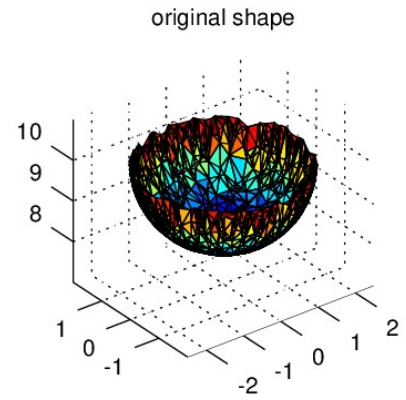
p = (R'*t)*R*[2;2;2]
The point p will be at (2, 2, -4)

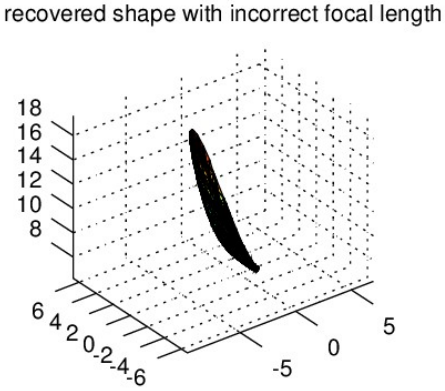
3
Correct focal length





Incorrect focal length





The some parts of the surface is stretched long the z axis. The reason is the image in the left camera looks “closer” because of the enlarged focal length. After scaling by 1/f, the disparity between two images is less than expected, which corresponds to further z value. The error should be less than 1% for more complicated depth function like face.