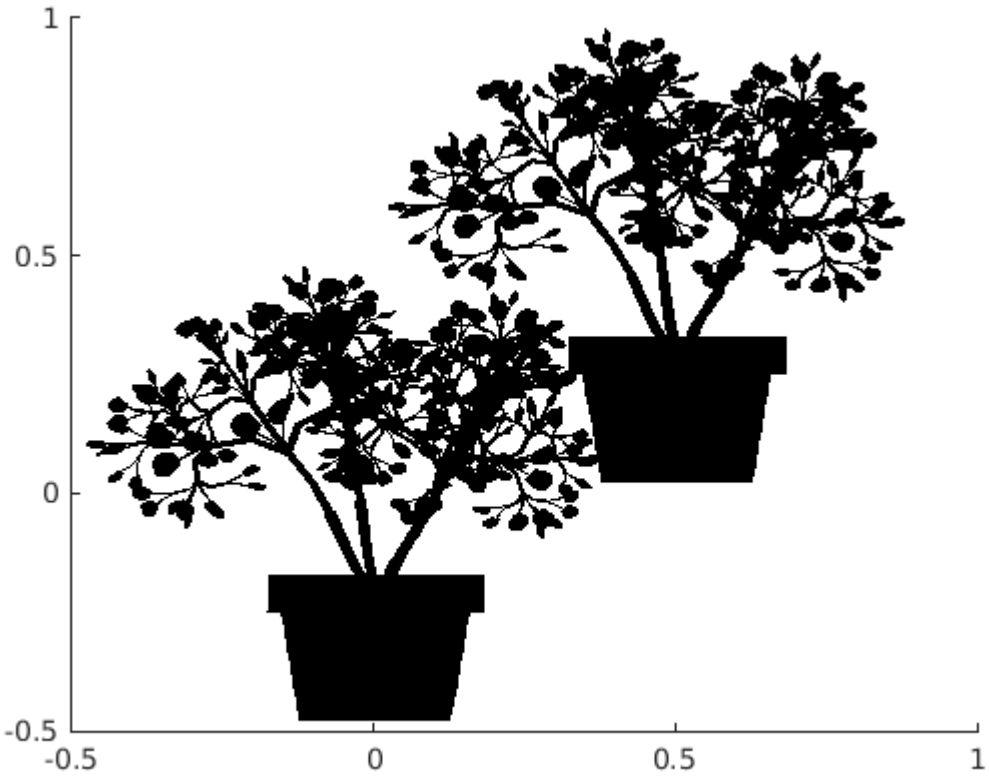
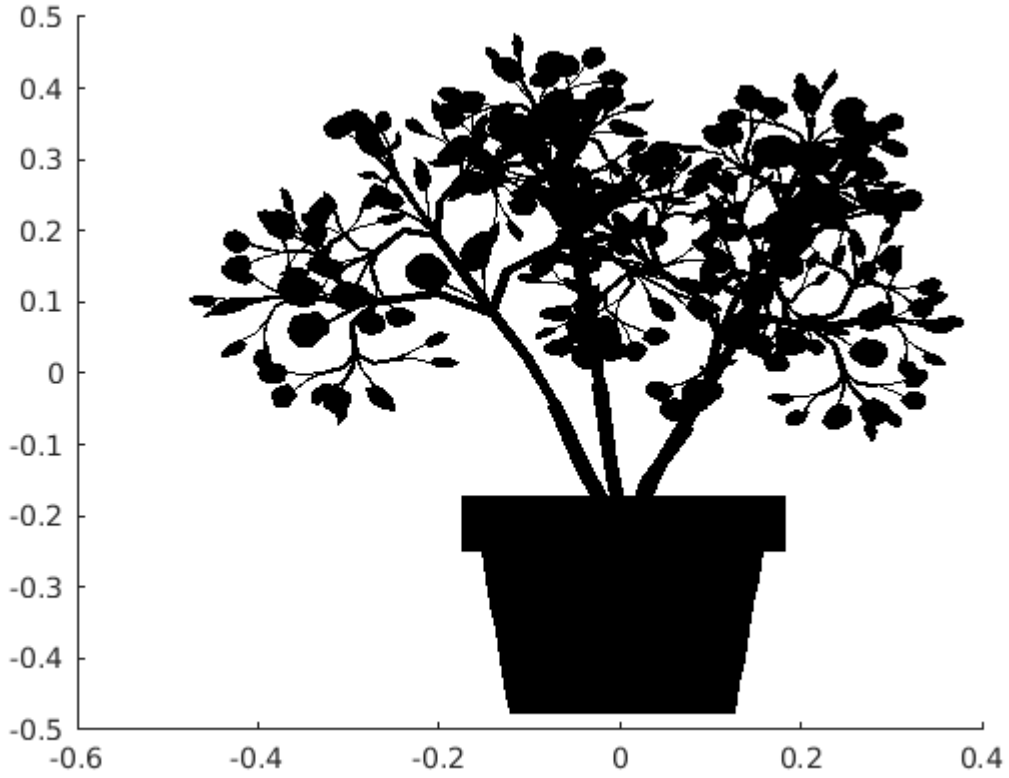
Image Formation by Perspective Projection

```
[V, F]=openOFF('model.off',' ');
v_new=[V.';ones(1,19105)];
TR=[-0.5 -0.5 1].';
Hom_Mat=[eye(3,3) TR];
V_NEW=Hom_Mat*v_new;
```

```
P = patch('Vertices', V, 'Faces', F, 'FaceVertexCData',0.3*ones(size(V,1),3));
```




```
figure;
P = patch('Vertices', V_NEW.', 'Faces', F, 'FaceVertexCData',0.3*ones(size(V,1),3));
```

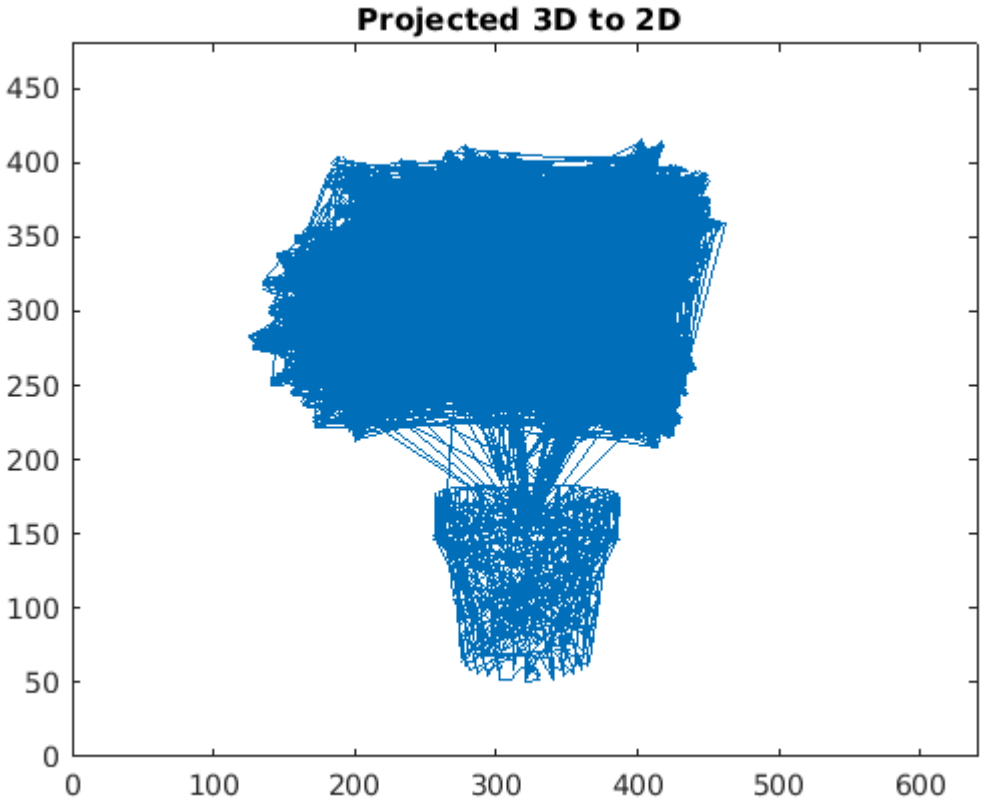



```
X=V_NEW
```

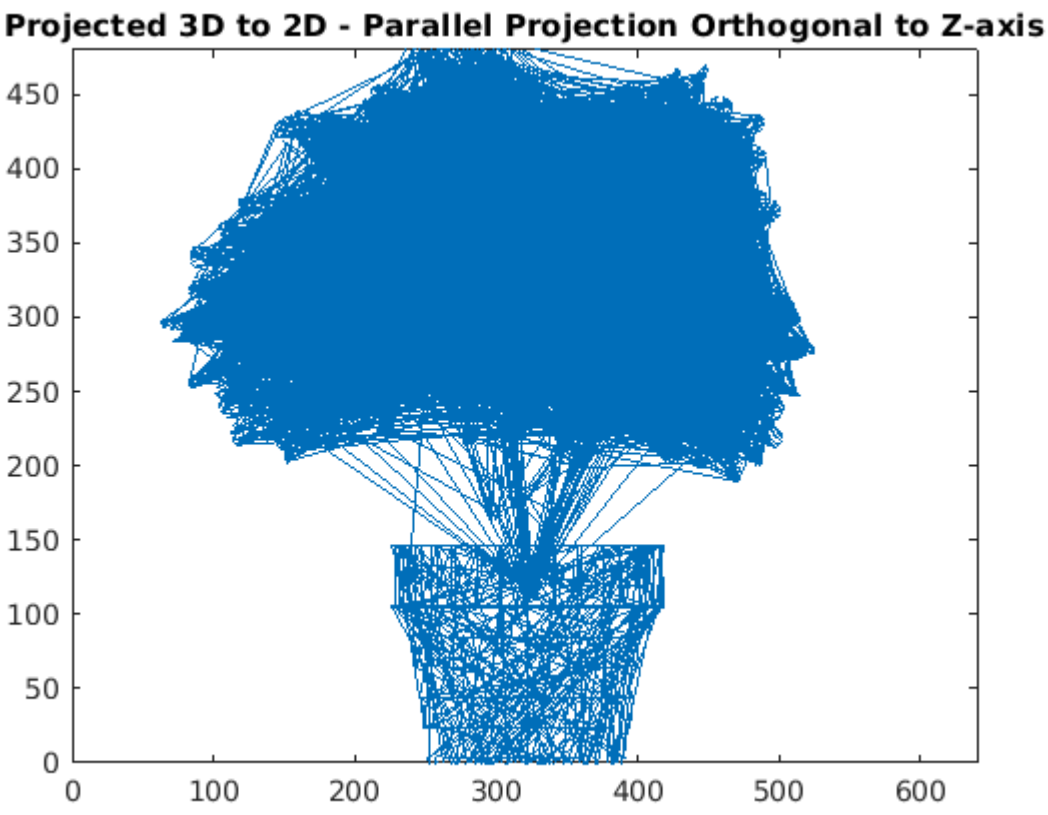
```
X = 3×19105
   -0.0344   -0.0332   -0.0362    0.3279    0.3287    0.3253    0.3053    0.3102 ···
    0.0525    0.0582    0.0558    0.2488    0.2555    0.2568    0.1501    0.1568
    1.6782    1.6841    1.6683    1.4837    1.4835    1.4853    1.6094    1.6112
```

```
ud=(540*X(1,:))./X(3,:) + 320;
vd=(540*X(2,:))./X(3,:) + 240;
```

```
plot(ud,vd)
axis([0 640 0 480])
title("Projected 3D to 2D  ")
```




```
UO=540*X(1,:) +320;
VO=540*X(2,:) + 240;
plot(UO,VO)
axis([0 640 0 480])
title("Projected 3D to 2D - Parallel Projection Orthogonal to Z-axis")
```


Projected 3D to 2D - Parallel Projection Orthogonal to Z-axis
450
400
350
300
250
200
150
100
50
0
0
100
200
300
400
500
600