Transform

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1 介绍

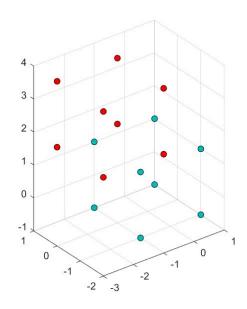
Transform用于坐标的三维变换。

2 案例

2.1 Translate (Flag=1)

```
P1=[-1,1,1;1,1,1;1,-1,1;-1,-1,1;-1,1,-1;1,1,-1;1,-1,-1;-1,-1,-1];
   T=Transform(P1);
   T=Translate(T,-2,-1,3);
 3
4
   P2=Solve(T);
5
    scatter3(P1(:,1),P1(:,2),P1(:,3), ...
      'MarkerEdgeColor','k',...
6
      'MarkerFaceColor',[0 .75 .75]);
7
8
    hold on
9
    scatter3(P2(:,1),P2(:,2),P2(:,3), ...
      'MarkerEdgeColor','k',...
10
      'MarkerFaceColor',[1 0 0]);
11
    axis equal
12
```

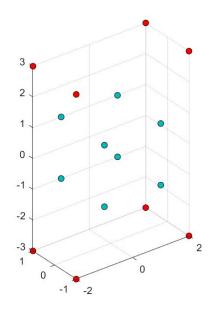
平移变换



2.2 Scale (Flag=2)

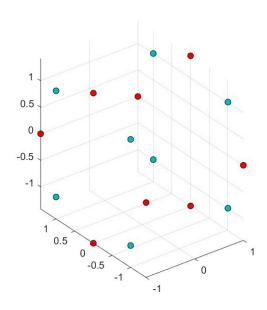
```
1
    \mathsf{P1} \! = \! [\, -1,1,1;1,1,1;1,-1,1;-1,-1,1;-1,1,-1;1,1,-1;1,-1,-1;-1,-1,-1]\,;
 2
    T=Transform(P1);
    T=Scale(T,2,1,3);
4
    P2=Solve(T);
5
    scatter3(P1(:,1),P1(:,2),P1(:,3), ...
6
       'MarkerEdgeColor','k',...
 7
       'MarkerFaceColor',[0 .75 .75]);
8
    scatter3(P2(:,1),P2(:,2),P2(:,3), ...
9
      'MarkerEdgeColor', 'k',...
10
11
       'MarkerFaceColor',[1 0 0]);
12
    axis equal
```

缩放



2.3 Rotate (Flag=3)

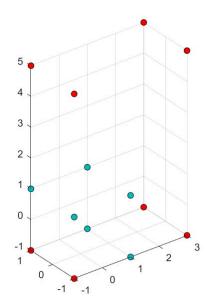
```
1
    P1=[-1,1,1;1,1,1;1,-1,1;-1,-1,1;-1,1,-1;1,1,-1;1,-1,-1;-1,-1,-1];
 2
    T=Transform(P1);
 3
    T=Rotate(T,45,0,0);
    P2=Solve(T);
5
    scatter3(P1(:,1),P1(:,2),P1(:,3), ...
      'MarkerEdgeColor','k',...
6
 7
      'MarkerFaceColor',[0 .75 .75]);
8
    hold on
9
    scatter3(P2(:,1),P2(:,2),P2(:,3), ...
10
      'MarkerEdgeColor','k',...
      'MarkerFaceColor',[1 0 0]);
11
12
    axis equal
```



2.4 Scale wirh origin point (Flag=4)

```
1
    P1=[-1,1,1;1,1,1;1,-1,1;-1,-1,1;-1,1,-1;1,1,-1;1,-1,-1;-1,-1,-1];
2
   T=Transform(P1);
3
   T=Scale(T,2,1,3,'Ori',[-1,-1,-1]);
    P2=Solve(T);
4
5
    scatter3(P1(:,1),P1(:,2),P1(:,3), ...
6
      'MarkerEdgeColor','k',...
7
      'MarkerFaceColor',[0 .75 .75]);
    hold on
8
9
    scatter3(P2(:,1),P2(:,2),P2(:,3), ...
      'MarkerEdgeColor','k',...
10
      'MarkerFaceColor',[1 0 0]);
11
    axis equal
12
```

绕原点缩放



2.5 Rotate wirh origin point (Flag=5)

```
P1=[-1,1,1;1,1,1;1,-1,1;-1,-1,1;-1,1,-1;1,1,-1;1,-1,-1;-1,-1,-1];
1
 2
    T=Transform(P1);
    T=Rotate(T,0,0,45,'Ori',[-1,-1,-1]);
    P2=Solve(T);
4
5
    scatter3(P1(:,1),P1(:,2),P1(:,3), ...
      'MarkerEdgeColor','k',...
6
      'MarkerFaceColor',[0 .75 .75]);
7
8
9
    scatter3(P2(:,1),P2(:,2),P2(:,3), ...
      'MarkerEdgeColor','k',...
10
      'MarkerFaceColor',[1 0 0]);
11
12
    axis equal
```

绕原点旋转

