



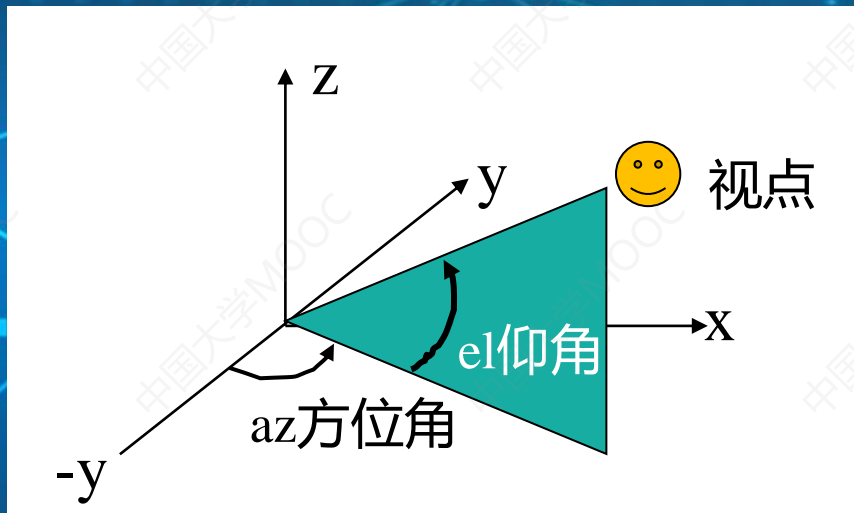
数据科学基础 I (Matlab)

— 东北大学 —





查看绘图的视角

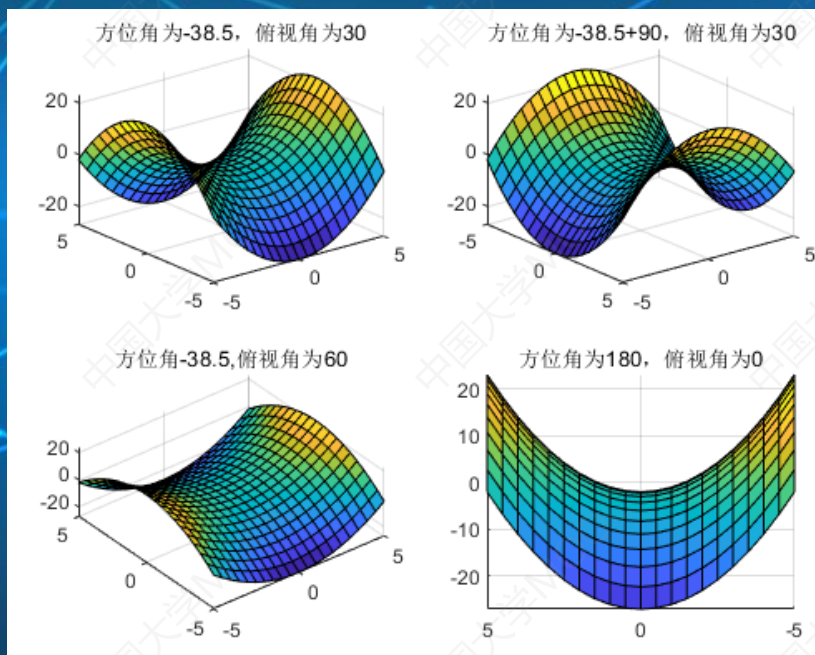


`view(az,el)`, 设置三维绘图的视角, `az`是方位角,
`el`表示相对于xoy平面的仰角



改变视角效果——view

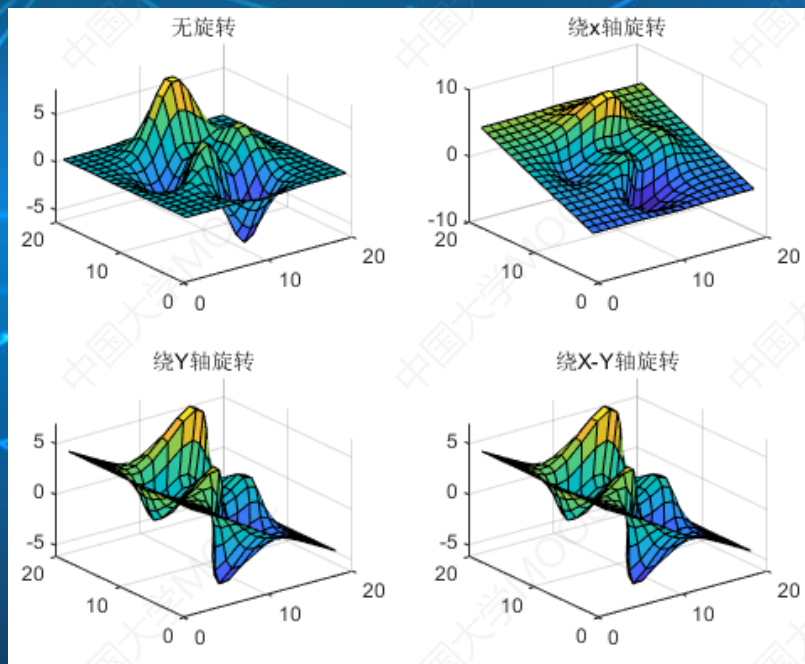
```
>> x = -5:0.5:5;  
>> [x,y] = meshgrid(x);  
>> z = x.^2-y.^2-2;  
>> subplot(2,2,1); surf(x,y,z);  
>> view(-38.5,30);  
>> subplot(2,2,2); surf(x,y,z);  
>> view(-38.5+90,30);  
>> subplot(2,2,3); surf(x,y,z);  
>> view(-38.5,60);  
>> subplot(2,2,4); surf(x,y,z);  
>> view(180,0);
```





旋转三维图形——rotate

```
>> f1 = subplot(2,2,1);  
>> surf(f1,peaks(20));  
>> f2 = subplot(2,2,2);  
>> h2 = surf(f2,peaks(20));  
>> rotate(h2, [1 0 0],25)  
>> f3 = subplot(2,2,3);  
>> h3 = surf(f3,peaks(20));  
>> rotate(h3, [0 1 0],25)  
>> f4 = subplot(2,2,4);  
>> h4 = surf(f4,peaks(20));  
>> rotate(h4, [1 1 0],25)
```





光照效果控制

光照是引入方向光源照亮物体，能使表面微妙的差异更容易看到，同时也能增加三维图形的现实感

- light函数：创建光源对象
- lighting函数：指定光照算法
- camlight函数：在照相机坐标系中创建或移动光源对象
- lightangle函数：在球面坐标中创建或定位光源对象



光照效果控制

```
>> [X,Y] = meshgrid(-3:0.25:3);  
>> Z = peaks(X,Y);  
>> surf(X,Y,Z);  
>> axis([-3 3 -3 3 -10 10]);  
>> grid on;  
>> light;  
>> lighting phong;  
>> camlight('left');
```

