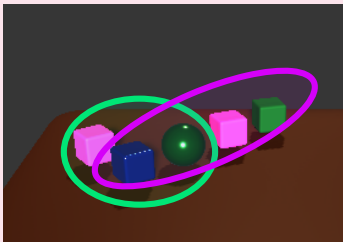
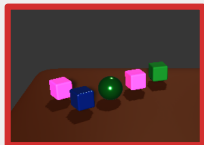


NeSy- π

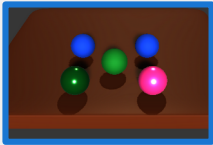


```
inv_pred3(o1,o2,o3,o5):-  
    in(o1,X),in(o2,X),in(o3,X),  
    in(o5,X),  
    rho(o1,o2,rho0),rho(o1,o5,rho0).  
  
inv_pred4(o1,o2,o5):-  
    in(o1,X),in(o2,X),in(o5,X)  
    :  
    rho(o1,o2,rho0),rho(o1,o5,rho0).
```

Visual ILP problem \mathcal{Q}



positive



negative



**Invented
Predicates**

NeSy-ILP

$\min_{\mathcal{W}} L(\mathcal{Q}, \mathcal{C}, \mathcal{W})$

\mathcal{W} : clause weights

L : loss function

```
0.9: kp(X):-  
    in(o1,X),in(o2,X),in(o3,X),  
    in(o4,X),in(o5,X),  
    inv_pred3(o1,o2,o3,o5),  
    inv_pred4(o2,o4,o5).  
  
0.1: kp(X):-  
    in(o1,X),in(o2,X),in(o3,X),  
    :  
    in(o4,X),in(o5,X),  
    color(o1,pink),shape(o2,cube).
```