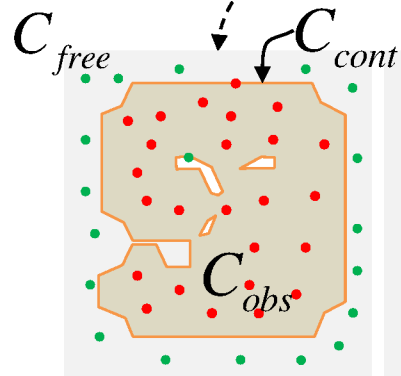
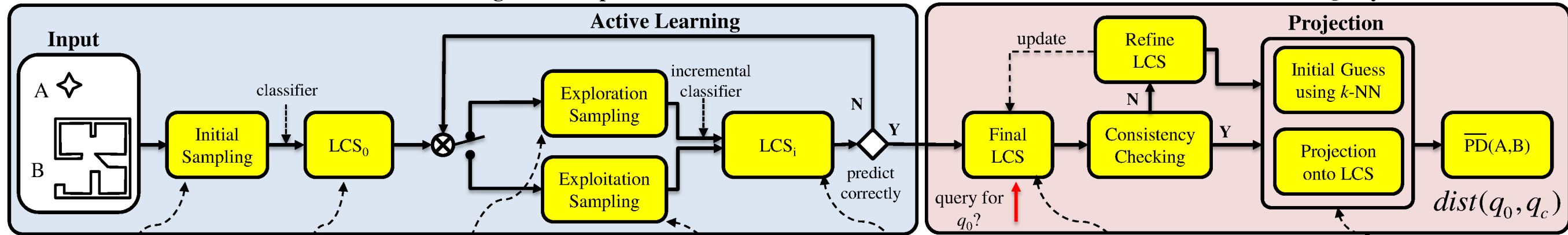


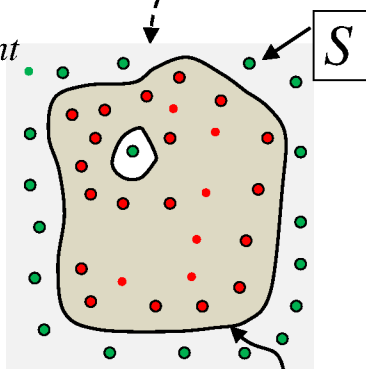
# Offline Learning Contact Space

# Runtime PD Query



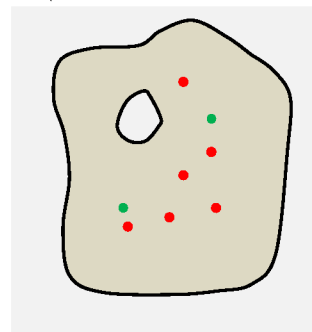
exact contact space (orange)

(a)



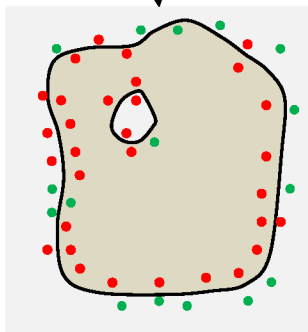
LCS<sub>0</sub>

(b)



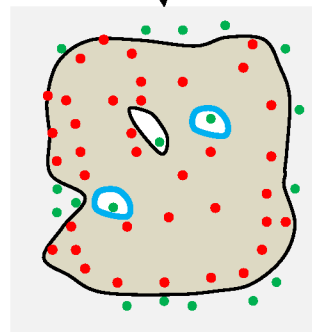
exploration

(c)



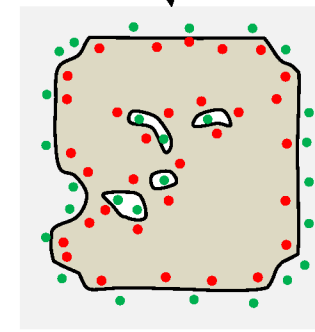
exploitation

(d)



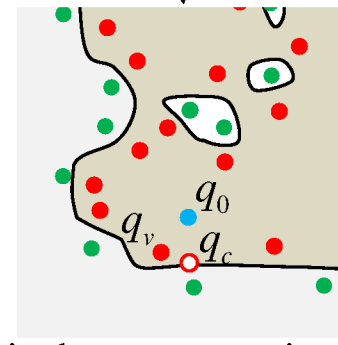
LCS<sub>i</sub>  
after  $i$ th iteration  
of active learning

(e)



final LCS after  
active learning

(f)



$q_v$  is the nearest point to  $q_0$   
and  $q_c$  is the projection of  
 $q_0$  onto LCS

(g)