
Algorithm 3 PresenceProb (evolving-density trajectory record rec , query point q with radius r_q , prob. threshold ρ)

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1:  $N \leftarrow 2 \ln(1/\delta) \phi^2 \rho$  ▷ suggested by Lemma 4.2 in [38]  
2:  $hit \leftarrow 0$  ▷ hitting count  
3: for counter  $i$  from 1 to  $N$  do ▷ random point generation  
4:   point  $s \leftarrow \text{GaussianGenerator}(rec.\mu, rec.\sigma)$   
5:   if  $\|s, q\| \leq r_q$  then  
6:      $hit \leftarrow hit + 1$   
7: return  $hit/N$ 
```
