

Reward Function 2 - Instant Parking: SAC, TD3, DDPG

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1:  $reward \leftarrow 0$ 
2: if car is inside parking spot then
3:    $reward \leftarrow reward + 5000$ 
4:   if car entered parking spot moving forward then
5:      $reward \leftarrow reward + 1000$  ▷ Extra reward
6:   end if
7: else
8:    $reward \leftarrow reward - (offset\_x \times 6)$  ▷ Punishment based on
9:    $reward \leftarrow reward - (offset\_y \times 6)$  ▷ distance from x,y axis
10:  if car is moving forward then
11:     $reward \leftarrow reward + 1$ 
12:  end if
13:  if car collides then
14:     $reward \leftarrow reward - 10$ 
15:  end if
16:  if car is away from parking spot then
17:    if car is moving too slow then
18:       $reward \leftarrow reward - 5$ 
19:      if car is not moving then
20:         $reward \leftarrow reward - 5$ 
21:      end if
22:    end if
23:  else ▷ When the car is near the parking spot
24:    if car is moving too slow then
25:       $reward \leftarrow reward - 3$ 
26:      if car is not moving then
27:         $reward \leftarrow reward - 5$ 
28:      end if
29:    end if
30:    if car is in the right angle then
31:       $reward \leftarrow reward + 0.5$ 
32:    end if
33:  end if
34: end if
```