Assignment 3 - VO

Team BumbleBee
Vikrant Dewangan, 2018111024
Shivaan Sehgal, 2018111026

Approach

We have used a **sampling** based method for holonomic robots. By using a cost function, we choose the most optimal velocity based on the set of nearby velocity. The robot samples velocities in the range [-1,1] with precision of 0.01 and checks with immediate collision of 1s using collision cone.
The cost function formulated is as follows -

$$\min_v \|v-v_d\|^2 \quad \text{s.t.}$$
$$n_r * v_{rel} <= 0$$
$$n_l * v_{rel} <= 0$$

(for N obstacles, we get the equation)

$$\|\gamma_i\|_2^2 - \frac{(\vec{r_i}.(v_{RBi}+\Delta v))^2}{\|v_{RBi}+\Delta v\|^2} \geq R^2 \rightarrow (7)$$

$i = 1, 2, \ldots, n$

$n \rightarrow$ # obstacles.

subject to the constraints - |v| <= 2 and |a| <= 2.

Results