

Optimization and Algorithms

Project report

Group 58

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1 Task 1

2 Task 2

3 Task 3

4 Task 4

5 Task 5

Task 5. Using simple geometric arguments, give a closed-form expression for $d(p, D(c, r))$.

The only two possible outcomes that might happen are the following:

- The robot passes within the disc

$$\text{if } d(p(\tau_k), c_k) \leq r_k \text{ then } d_k = 0$$

- The robot passes outside of the disc

$$\text{if } d(p(\tau_k), c_k) > r_k \text{ then } d_k = d(p(\tau_k), c_k) - r_k$$

The whole equation can be written as

$$\max(0, d(p(\tau_k), c_k) - r_k)$$