

# **Robotics**

## **Assignment-4**

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### **Problem:**

Given a known bounded environment, that has some convex obstacles. We have to traverse two robots, from their respective start positions to their goals, while keeping both the robots in each others sensing range. The metric designed for this will minimise time to reach each of their goals (minimise path lengths) and avoid obstacles. Both the goals are less than the sensing range distance apart.

### **Algorithm:**

Since the environment is continuous, we have used RRT's. The algorithm begins by initiating an RRT with one of the Robot's starting location. Once it finds a valid path to it's goal, we store that path, and then we start the second RRT, but with a constraint on where it will expand to. On getting each new node, we check whether the distance between it and any of the nodes in the pre computed path is less than the sensing range. If so we will extend the RRT, if not we will choose a new random point. This way we can confine the second RRT in the path within the sensing range of the first robot.

### **Result:**

We used our algorithm on a number of different environments.

