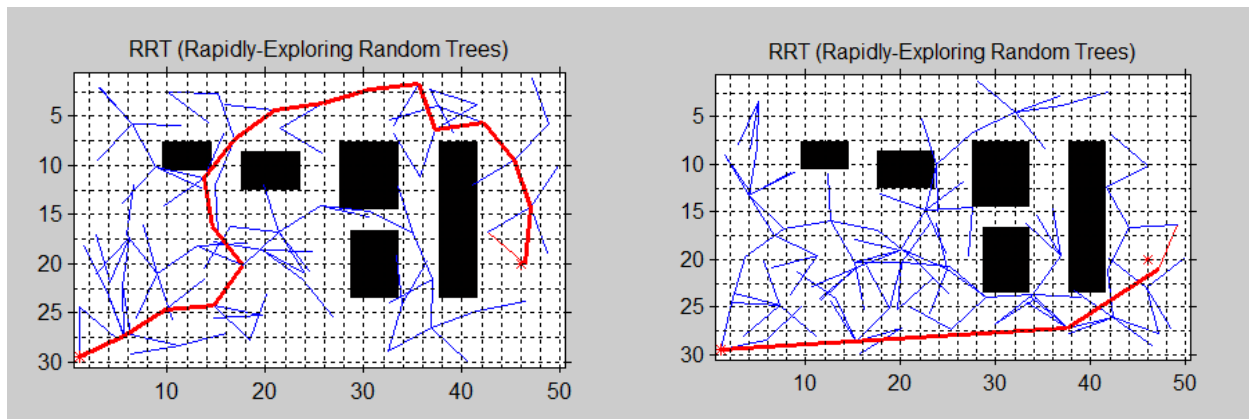


Mandeep Singh

Robotics Assignment 1

RRT (Rapidly-Exploring Random Trees)

- In RRT we maintain two lists Edges and Vertices.
- Vertices contains
 - All valid nodes as we compute new vertex.
 - Vertices must lie in obstacle free space.
- Edges contains
 - Two vertices which constitutes the edge.
 - The edge must lie in obstacle free space.
- Implementation
 - Find a random point within the environment
 - Find a nearest vertex to that random point.
 - Find a new point at the delta distance away from nearest point in the direction of random point.
 - Check if the new point and edge attached to it lies in free space by breaking the edge in intermediate points and checking for each point alone.
 - Keep doing this until the cell with the target is not reached or the edge constitutes the target.



- Matlab Code Info:
 - creating_environment.m is used to create a matrix with obstacles.
 - rrt_run.m calls rrt_implement with variable delta and environment.
 - Left one is un-simplified path from source to goal.
 - simplified.m simplifies the path as shown in right image.