Results Summary: Motion Planning

In this motion planning problem, we implement (Rapidly exploring Random Tress), i.e., RRT and RRT* in a sampling-based motion planning problem. Path generation is subject to kinodynamic constraints. That is, constraints on the possible paths to be taken in terms of minimum turning radius, velocity, and acceleration. Known class of kinodynamic constraints are Dubins path problem in which the path is subject to a curvature constraint as well as an initial and final tangential vector constraint.

The first approach to solve this problem was RRT in which it showed a non-optimal path from start to finish. The second approach implements RRT* which yields better results than RRT over 300 iterations. Note that the path generated by RRT* is suboptimal as the optimal path can theoretically be reached over an infinite number of iterations.

RRT Algorithm:

- Total cost from start to finish was 41.7.

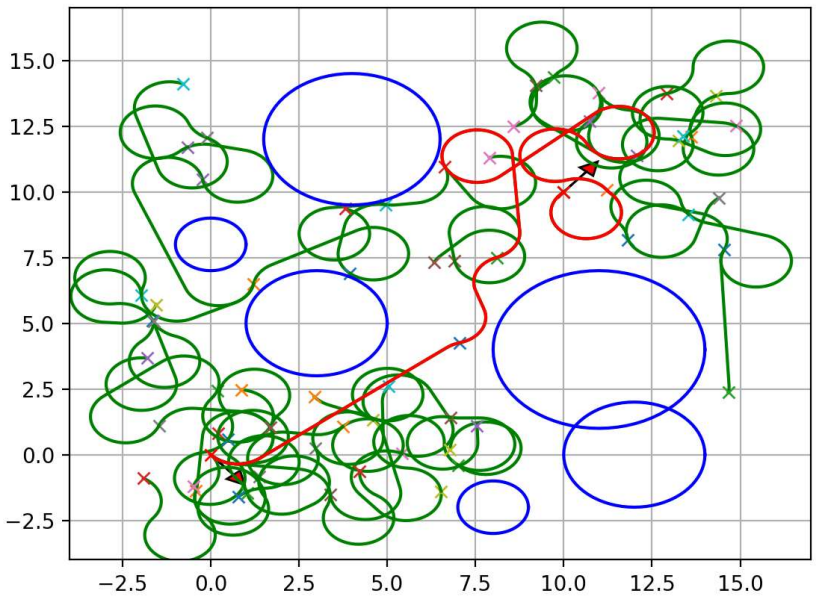

Figure 1: RRT Algorithm Results (Total cost: 41.7)

RRT* Algorithm:

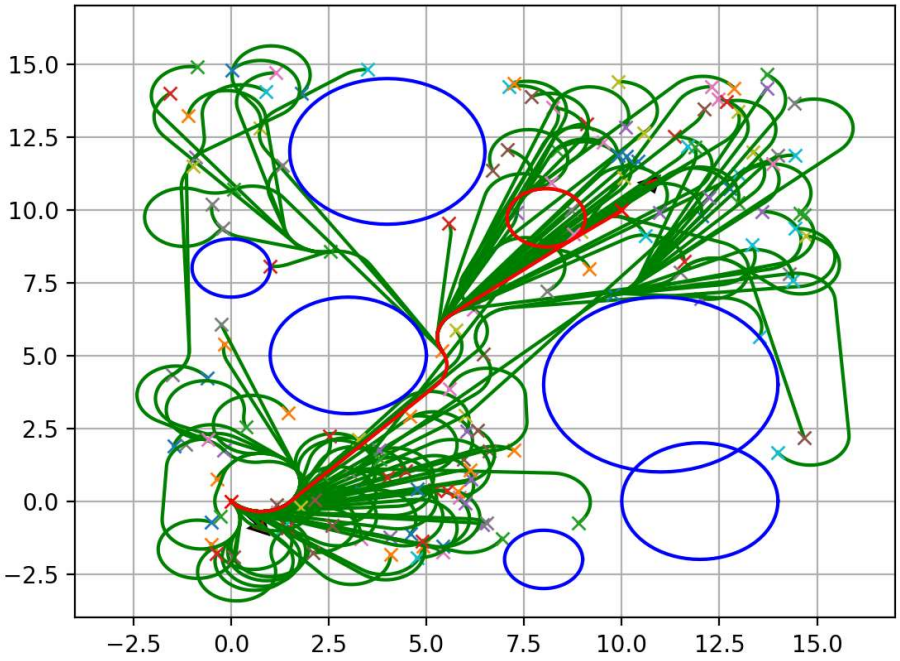

Figure 2: RRT Algorithm Results (Total Cost: 29)*