MPC-MAP Assignment No. 2 - Report

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Task 2 – Create a Path

In this task, I manually generated a path consisting of straight lines and arcs, starting from [2,8.5] and ending at the goal point [9,9]. I created two local functions called **create_line(p1, p2, nPoints)** that returns straight line from point1 to point2 with requested waypoints. The other function called **create_arc(center, radius, startDeg, endDeg, nPoints)** generates an arc centered at center with given radius. The arc starts at startDeg and ends at endDeg.

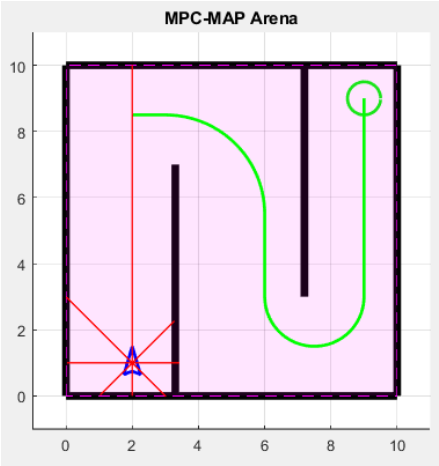

Figure 1 - Manual Path Planning

Task 3 – Motion Control

I implemented functions to determine the next navigation target for the robot and generate motion commands. The **get_target** function selects the next waypoint from the path from the last task and moves to another one when reached by the robot. The **plan_motion** function then calculates the wheel velocities using feedback linearization. A proportional regulator is used to control the robots movement toward the target, and speed limits are applied to ensure smooth and stable navigation.

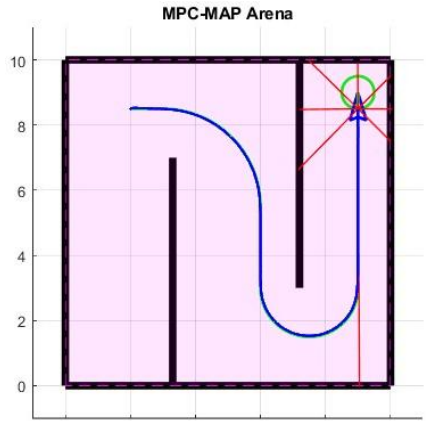

Figure 2 - Result of the planned motion