

Lecture 6, Sep 26, 2023

Dubin's Model

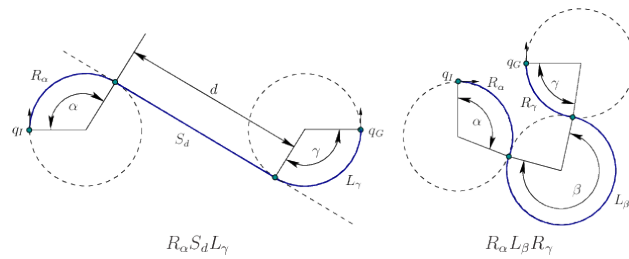


Figure 1: Example of Dubin's curves.

- Lester Eli Dubins proved that the shortest path between two points (with specified heading), with a minimum turning radius constraint, is a path with only straight and circular segments, corresponding to one of 6 types of curves:
 - LRL, RLR, LSL, LSR, RSL, RSR
 - Where L is a left turn of minimum radius, R is a right turn of minimum radius, and S is a straight line segment
 - This is the minimum-time path for a robot if the robot can only go forward at a constant velocity or stop
- To find the curves, we can draw two circles around each endpoint (one corresponding to a direction of rotation) and try to connect a circle on one side to a circle on the other side

Example: Wheel Constraint Model

- (see Xournal++ notes)