Homework 3 : Aircraft Collision Avoidance Analyses using Reachability

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1 Linear Velocity Control

Consider a system of two planes (Dubin's vehicles) on a collision course. Our two planes can only control their linear velocity and cannot escape into a veering mode. Our system with no turning and using relative coordinates only is:

$$\begin{aligned}\dot{x}_r &= -u + dcos(\psi_r)\\ \dot{y}_r &= dsin(\psi_r)\\ \dot{\psi}_r &= 0\end{aligned}$$

2 Mode Switching Control