RIPNA takeaways

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Key Takeaways

- R_{des} : min distance you want between 2 drones.
- Sensor Range.
- Minimum Radius of turn → R_{min}
- Constant speed define : V
- heading : ψ . $\dot{x} = V\cos(\psi)$ $\quad \dot{\psi} = u_i = \frac{V}{R_{min}}$
  $\dot{y} = V\sin(\psi)$

- ZEM : minimum distance between 2 UAVs.

$$S^2 = \left[(P_1 + Vtd_1) - (P_2 + Vtd_2)\right]^2$$

$$= \left[\{(x_1, y_1) + t(V\cos\psi_1, V\sin\psi_1)\} - \{(x_2, \dots\right]$$

$$\frac{dS}{dt} = 0 \Rightarrow \quad t_{go} = \frac{(P_1 - P_2)(d_1 - d_2)}{V(d_1 - d_2)^2}$$

- if $t_{go} > 0 \Rightarrow$ ZEM occurs.
- $S(t_{go}) = ZEM$
- if $ZEM < R_{des} \Rightarrow$ Perform collision maneuver
- Radius^ (to be) caused by acceleration:

$$R = R_{min}\, e^{\lambda \frac{ZEM}{R_{des}}} \qquad a = \frac{V^2}{R}$$

$R > R_{min}$ always.

Efficiency Parameter: $\frac{1}{N}\sum_{i=1}^{N} \frac{t_{ideal}^{i}}{t_{actual}^{i}}$

- Optimal values:

- optimal values:

$R_{sense} = 10$

$R_{des} = 6$

$R_{min} = \frac{5}{\pi}$ (5^0 per sec)

$\lambda = 0.5$

UAV speed = 500 miles/hour.