

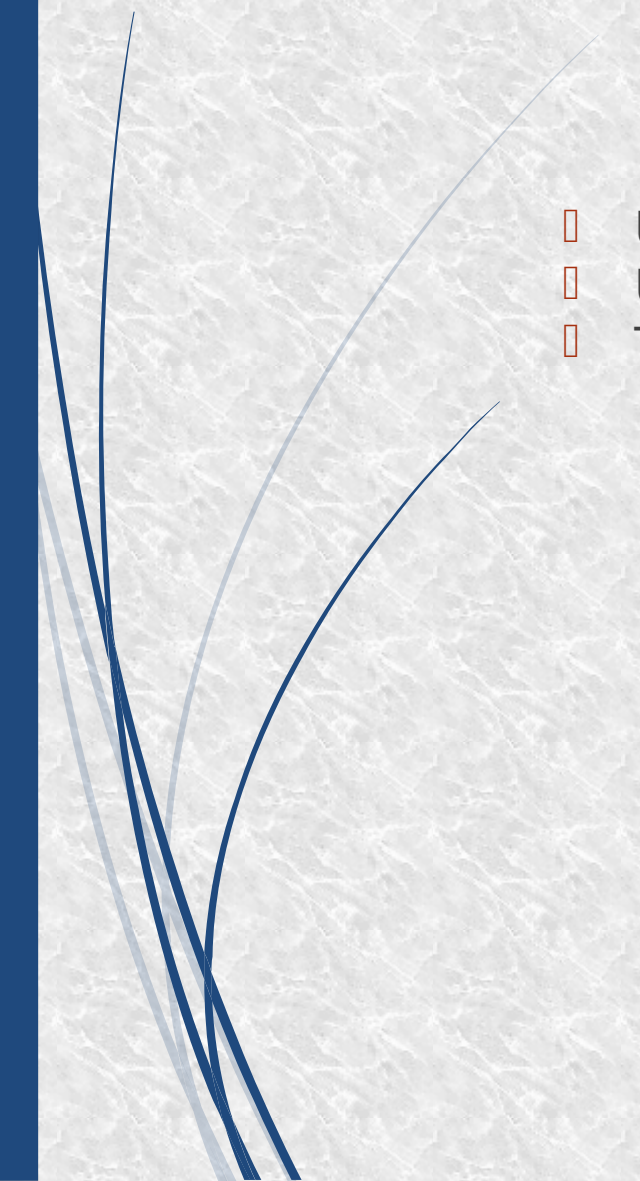


Otto Pilot

Developed by Zach Montgomery



Full 12 state LQR controller

- User can choose to control either climb angle or altitude
 - User can choose to control either bank angle or heading
 - These options are combined giving 4 different control scenarios
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Full 12 state LQR controller

- Aircraft controllers usually consist of two separate controllers
 - One for longitudinal motion and the other for lateral motion
 - Aerodynamic coupling from the two modes are simple treated as disturbances
- Full 12 state controllers are uncommon
 - This accounts for any aerodynamic coupling that may happen
 - More robust method, allowing for more states

Algebraic Riccati Equation

$$\begin{aligned}\dot{x} &= Ax + Bu \\ y &= Cx + Du\end{aligned}$$

$$0 = PA + A^T P + Q - PBR^{-1}B^T P$$

$$K = R^{-1}B^T P$$

Block Diagram

