Quadplane Project Instructions

Dean Anderson

July 2024

Introduction

Control Definitions

On our plane, we will have the following controls, which we can use to effect the state of the plane. They are defined as follows.

Control Surfaces

The control surfaces are defined as follows, as Elevator, Aileron, and Rudder.

$$\begin{bmatrix} \delta_e \\ \delta_a \\ \delta_r \end{bmatrix} \in \begin{bmatrix} -1, 1 \\ -1, 1 \\ -1, 1 \end{bmatrix}$$

Throttles

The five throttle controls are defined as follows.

$$\begin{bmatrix} \delta_{r_1} \\ \delta_{r_2} \\ \delta_{r_3} \\ \delta_{r_4} \\ \delta_{r_5} \end{bmatrix} \in \begin{bmatrix} 0, 1 \\ 0, 1 \\ 0, 1 \\ 0, 1 \\ 0, 1 \end{bmatrix}$$

δ_{r_1} is port front motor.
δ_{r_2} is port rear motor.
δ_{r_3} is the starboard rear motor.
δ_{r_4} is the starboard front motor.
δ_{r_5} is the forward propulsion motor.