Contents

"Smack my pitch up."

The Prodigy (1997)

1 Optimal control of pitch/travel with no feedback

1.1 State space form

We want to write the model in equation 1.1.1 in continuous time state space form with $x = [\lambda \ r \ p \ \dot{p}]^T$ and $u = p_c$

$$\dot{x} = A_c x + B_c u \tag{1.1.1}$$

"I've got 99 problems, but a pitch ain't one."

Ice-T (1993)

2 Optimal control of pitch/travel with LQ control

3 Optimal control of pitch/travel and elevation with and without feedback

4 Pastebin (remove before handing in lol)

4.1 Copied source for system description equations

$$\ddot{e} + K_3 K_{ed} \dot{e} + K_3 K_{ep} e = K_3 K_{ep} e_c \tag{4.1.1a}$$
$$\ddot{p} + K_1 K_{pd} \dot{p} + K_1 K_{pp} p = K_1 K_{pp} p_c \tag{4.1.1b}$$
$$\dot{\lambda} = r \tag{4.1.1c}$$
$$\dot{r} = -K_2 p \tag{4.1.1d}$$