

Kalman Filter Implementation Report

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1 Equations of Motion Used

The Equations of Motion Used Are:

1. $s_t = s_o + v_{t-1} \times T$
2. $v_t = v_{t-1} + a \times T$

2 State Vector

This is the state vector \vec{X}

$$\begin{bmatrix} x \\ y \\ z \\ v_x \\ v_y \\ v_z \\ a_z \end{bmatrix}$$

a_z is always going to be 9.81, it will never change but i needed g in the equation so that i can write the A matrix.

Transition state:

$$X_{t+1} = A \times X_t$$

There is no noise as we are not taking any sensor measurements, so i have not put the white noise