Equation of Motions already included

April 11, 2018

These are the equations already included the 6DOF model.

$$C_{b/n} = \begin{bmatrix} cos(\theta)cos(\psi) & cos(\theta)sin(\psi) & -sin(\theta) \\ -cos(\phi)sin(\psi) + sin(\phi)sin(\theta)cos(\psi) & cos(\phi)cos(\psi) + sin(\phi)sin(\theta)sun(\psi) & sin(\phi)cos(\theta) \\ sin(\phi)sin(\psi) + cos(\phi)sin(\theta)cos(\psi) & -sin(\phi)cos(\psi) + cos(\phi)sin(\theta)sin(\psi) & cos(\phi)cos(\theta) \end{bmatrix}$$

Also represented as: $C_{b/n} = fn(\Theta)$

$$\Omega = \begin{bmatrix} 0 & -R & Q \\ R & 0 & -P \\ P & -Q & 0 \end{bmatrix}$$

$$\begin{bmatrix} \dot{\phi} \\ \dot{\theta} \\ \dot{\psi} \end{bmatrix} = \begin{bmatrix} 1 & tan(\theta)sin(\phi) & tan(\theta)cos(\phi) \\ 0 & cos(\phi) & -sin(\phi) \\ 0 & sin(\phi)/cos(\theta) & cos(\phi)/cos(\theta) \end{bmatrix} \times \begin{bmatrix} P \\ Q \\ R \end{bmatrix}$$

Also represented as: $\dot{\Phi} = H(\Phi)\omega^b_{b/e}$

${}^b\dot{v}^b_{CM/e} = (\frac{1}{m})F^b_{A,T} + C_{b/n} \times g + \Omega^b_{b/e} \times v^b_{CM/e}$

${}^e\dot{p}^n_{CM/T} = C_{n/b} \times v^b_{CM/e}$

${}^b\dot{\omega}^b_{b/e} = inv(J^b) \times [M^b_{A,T} - \Omega^b_{b/e} \times J^b \times \omega^b_{b/e}]$