Rotational Dynamics

$$J\dot{\vec{\omega}} = \vec{\omega} \times (J\vec{\omega}) + \vec{\tau}_{dist} + \vec{\tau}_{act}$$

Rotational Kinematics. Quaternions

$$q = [\, \eta, \vec{\epsilon}\,]$$

$$\dot{\vec{\eta}} = \frac{1}{2} \vec{\epsilon} \cdot \omega_{ob}^{b}$$

$$\dot{\vec{\epsilon}} = \frac{1}{2} \left(\eta + Sq(\, \vec{\epsilon}\,) \right) \vec{\omega}_{ob}^{b}$$