

$$x_{k+1}^{\downarrow} = a x_k + \varepsilon_k$$

$$P(x_{k+1} | y_1 \dots y_k)$$

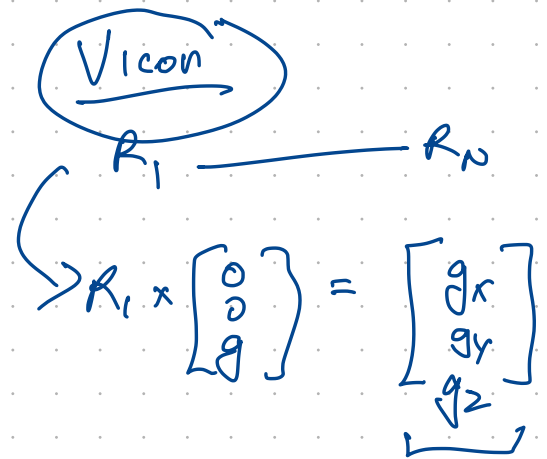
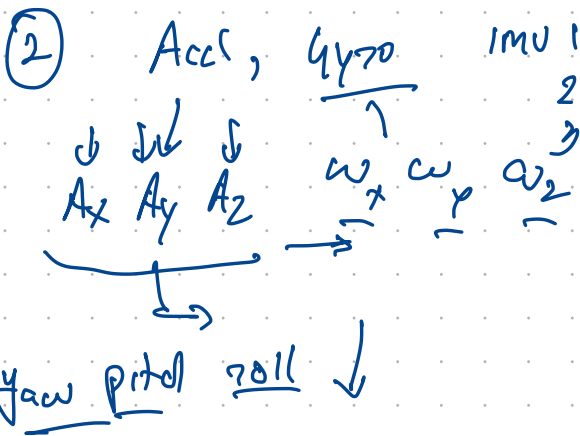
$$\Rightarrow a = -1 \quad \underbrace{y_1 \dots y_{100}}$$

$$\varepsilon_k \rightsquigarrow a$$

$$y_{k+1} = (1 + x_k^2)^{1/2} + v_k$$

(C/x\_k + v\_k)

$$P(a | y_1 \dots y_{100})$$



(θ, ω)

↓ (cos(θ/2), sin(θ/2) · ω)

② UKF

$$\begin{bmatrix} a \\ \omega \end{bmatrix}$$

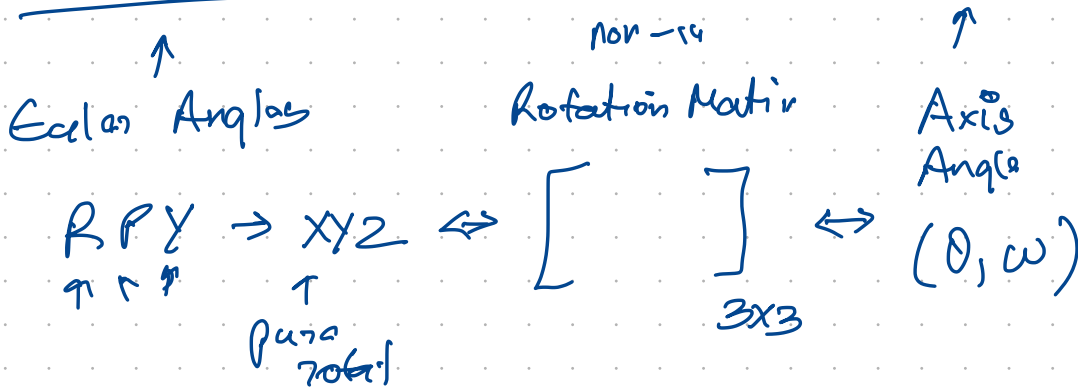
$$q = [q_0, q]$$

$$Q \quad R \rightarrow Q$$

$$Q \rightarrow EA$$

multi  $q_1 \times q_2$

### 3D Rotations



$$q = (0, 0, 0) \quad (R \leftrightarrow q \leftrightarrow (\theta, \omega))$$

$$q_1 \times q_2 = ( \quad ) \quad [ \quad ]$$

$$q_0 + q_1 i + q_2 j + q_3 k \quad \left( \cos \frac{\theta}{2}, \sin \frac{\theta}{2} \omega \right)$$

unit

Given a map  $\rightarrow$  localization  $\Downarrow$

Given the position/pose  $\rightarrow$  Mapping  
 $(x, y, z, \text{orient})$

SLAM

