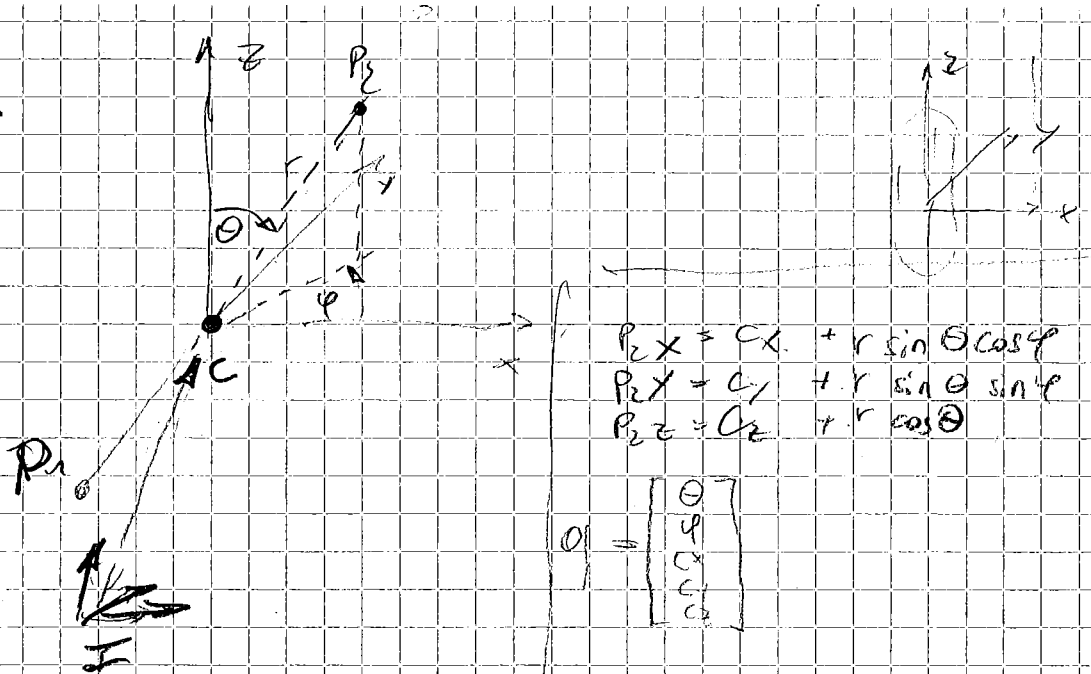
TESTBED SETUP



$$P_2x = C_x + r\sin\theta\cos\varphi$$
$$P_2y = C_y + r\sin\theta\sin\varphi$$
$$P_2z = C_z + r\cos\theta$$

$$q = \begin{bmatrix} \theta \\ \varphi \\ C_x \\ C_y \\ C_z \end{bmatrix}$$

$$P_1x = C_x - r\sin\theta\cos\varphi$$
$$P_2y = C_y - r\sin\theta\sin\varphi$$
$$P_2z = C_z - r\cos\theta$$

$$J(q,c) = \begin{bmatrix} 0 & \cdots & 0 \\ 0 & & \vdots \\ 0 & 1 & \\ & & 1 \\ 1 & & \\ 0 & \cdots & 1 \end{bmatrix}$$

Task: $\underbrace{J(q,c)}_{A}\,\dot{q} = -\lambda \underbrace{(c-t)}_{b}$

$$J(q,P_1) = \begin{bmatrix} -r\cos\theta\cos\varphi & r\sin\theta\sin\varphi & 1 & 0 & 0 \\ -r\cos\theta\sin\varphi & -r\sin\theta\cos\varphi & 0 & 1 & 0 \\ r\sin\theta & 0 & 0 & 0 & 1 \end{bmatrix}$$

Task: $-n^T J(q,P_i)\,\dot{q} \leq \lambda_0 \frac{d-d_s}{d_i-d_s}$

$$J(q,P_2) = \begin{bmatrix} r\cos\theta\cos\varphi & -r\sin\theta\sin\varphi & 1 & 0 & 0 \\ r\cos\theta\sin\varphi & r\sin\theta\cos\varphi & 0 & 1 & 0 \\ -r\sin\theta & 0 & 0 & 0 & 1 \end{bmatrix}$$

T = getTransform(c, θ, φ)

↳ φ robots around z

↳ −θ robots around rotated y