

$$\mathbf{J}_p(q) = \begin{bmatrix} \frac{\partial p_x}{\partial q_1} & \frac{\partial p_x}{\partial q_2} & \cdots & \frac{\partial p_x}{\partial q_n} \\ \frac{\partial p_y}{\partial q_1} & \frac{\partial p_y}{\partial q_2} & \cdots & \frac{\partial p_y}{\partial q_n} \\ \frac{\partial p_z}{\partial q_1} & \frac{\partial p_z}{\partial q_2} & \cdots & \frac{\partial p_z}{\partial q_n} \end{bmatrix}$$