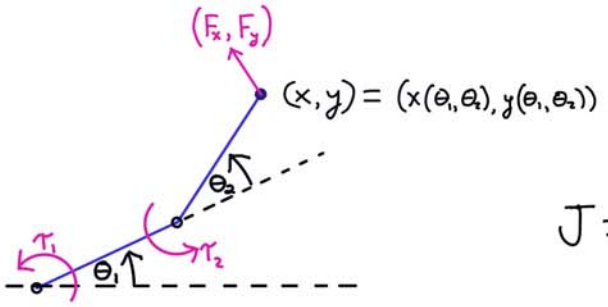

$$J = \begin{pmatrix} \frac{\partial x}{\partial \theta_1} & \frac{\partial x}{\partial \theta_2} \\ \frac{\partial y}{\partial \theta_1} & \frac{\partial y}{\partial \theta_2} \end{pmatrix} \qquad J^T = \begin{pmatrix} \frac{\partial x}{\partial \theta_1} & \frac{\partial y}{\partial \theta_1} \\ \frac{\partial x}{\partial \theta_2} & \frac{\partial y}{\partial \theta_2} \end{pmatrix}$$

$$\begin{pmatrix} \Delta x \\ \Delta y \end{pmatrix} = J \begin{pmatrix} \Delta\theta_1 \\ \Delta\theta_2 \end{pmatrix} \qquad \begin{pmatrix} \tau_1 \\ \tau_2 \end{pmatrix} = J^T \begin{pmatrix} F_x \\ F_y \end{pmatrix}$$

Virtual Work Argument

$$(F_x \; F_y) \begin{pmatrix} \Delta x \\ \Delta y \end{pmatrix} = \Delta W = (\tau_1 \; \tau_2) \begin{pmatrix} \Delta\theta_1 \\ \Delta\theta_2 \end{pmatrix}$$

So:
$$(F_x \; F_y) J \begin{pmatrix} \Delta\theta_1 \\ \Delta\theta_2 \end{pmatrix} = (\tau_1 \; \tau_2) \begin{pmatrix} \Delta\theta_1 \\ \Delta\theta_2 \end{pmatrix}$$

$$(F_x \; F_y) J = (\tau_1 \; \tau_2)$$

$$\begin{pmatrix} \tau_1 \\ \tau_2 \end{pmatrix} = J^T \begin{pmatrix} F_x \\ F_y \end{pmatrix}$$

(Recall that $(AB)^T = B^T A^T$.)