

$$\begin{bmatrix} \delta x \\ \delta y \end{bmatrix} = \left( \begin{bmatrix} x_{in} \\ y_{in} \end{bmatrix} - \begin{bmatrix} 320 & 240 \end{bmatrix} \right) \cdot \begin{bmatrix} 89.5/640 \\ 71.5/480 \end{bmatrix}$$

$$\begin{bmatrix} l_{(1)t} \\ l_{(2)t} \\ l_{(3)t} \\ l_4 \end{bmatrix} = MotorPositionToLength \left( \begin{bmatrix} p_{(1)t} \\ p_{(2)t} \\ p_{(3)t} \\ p_4 \end{bmatrix} + 0.3533 + tension \right) + startingLengths$$

$$\begin{bmatrix} x_t \\ y_{current} \end{bmatrix} = forward_{kinematics} \left( \begin{bmatrix} l_{(1)t} \\ l_{(2)t} \\ l_{(3)t} \\ l_4 \end{bmatrix} \right)$$

Check boundaries  
Proportional control

$$\begin{bmatrix} \delta l_1 \\ \delta l_{(2)t} \\ \delta l_{(3)t} \\ \delta l_4 \end{bmatrix} = inversekinematics \left( \begin{bmatrix} x_t + \delta x \\ y_{current} + \delta y \end{bmatrix} \right) - \begin{bmatrix} l_{(1)t} \\ l_{(2)t} \\ l_{(3)t} \\ l_4 \end{bmatrix}$$

$$\begin{bmatrix} p_{(1)t+1} \\ p_{(2)t+1} \\ p_{(3)t+1} \\ p_4 \end{bmatrix} = motorLengthToPosition \left( \begin{bmatrix} \delta l_1 \\ \delta l_{(2)t} \\ \delta l_{(3)t} \\ \delta l_4 \end{bmatrix} \right) + \begin{bmatrix} p_{(1)t} \\ p_{(2)t} \\ p_{(3)t} \\ p_4 \end{bmatrix} - tension$$

$$\vec{l}_t = Pos2Len(p_t + 0.3533 + tension) + startingLength$$

$$(x_t, y_t) = forwardKinematics(\vec{l}_t)$$

check boundaries  
Proportional control

$$\delta \vec{l}_t = inverseKinematics \left( \begin{bmatrix} x_t \\ y_t \end{bmatrix} + \begin{bmatrix} \delta x_t \\ \delta y_t \end{bmatrix} \right) - \vec{l}_t$$

$$\vec{p}_{t+1} = Len2Pos(\delta \vec{l}_t) + \vec{p}_t - tension$$