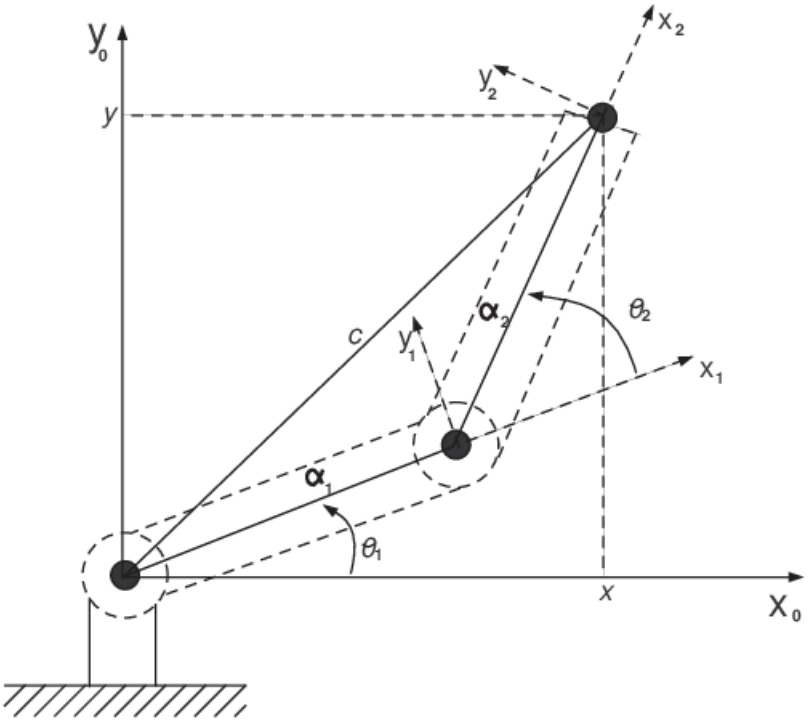
Two-link planar robot



https://www.researchgate.net/figure/Kinematic-Diagram-a-Two-Link-Planar-Manipulator_fig1_283377443

Forward Kinematic

$$\begin{cases} x = a_1 \cos\theta_1 + a_2 \cos(\theta_1 + \theta_2) \\ y = a_1 \sin\theta_1 + a_2 \sin(\theta_1 + \theta_2) \end{cases}$$

Inverse Kinematic

$$\begin{cases} \theta_2 = \tan^{-1} \frac{\pm\sqrt{1-\cos\theta_2{}^2}}{\cos\theta_2} \\ \theta_1 = \tan^{-1}(y_2/x_2) - \tan^{-1}(\frac{a_2 \sin\theta_2}{a_1 + a_2\cos\theta_2}) \end{cases}$$

Reference

https://robotacademy.net.au/lesson/inverse-kinematics-for-a-2-joint-robot-arm-using-geometry/